COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

Volume 84
Number Twelve
$1.00 a Year

OCTOBER, 1920

Published monthly by
W. R. C. Smith Publishing Co.,
Dalton, and Atlanta, Ga.

CRANETILT STEAM TRAPS SAVE COAL IN TEXTILE MILLS

THE discharging capacities of Cranetilt Traps are greater than any other style tilt trap on the market.

The Non-Return will handle ten times more water than bucket, pot or float traps having equal size pipe connections.

The Direct-Return will automatically return all condensation at any pressure or temperature, directly back into the boiler, and *reduce your coal bills.*

Branches in 59 leading cities

1855 — CRANE CO. — 1920

836 South Michigan Avenue - Chicago

Works: Chicago and Bridgeport

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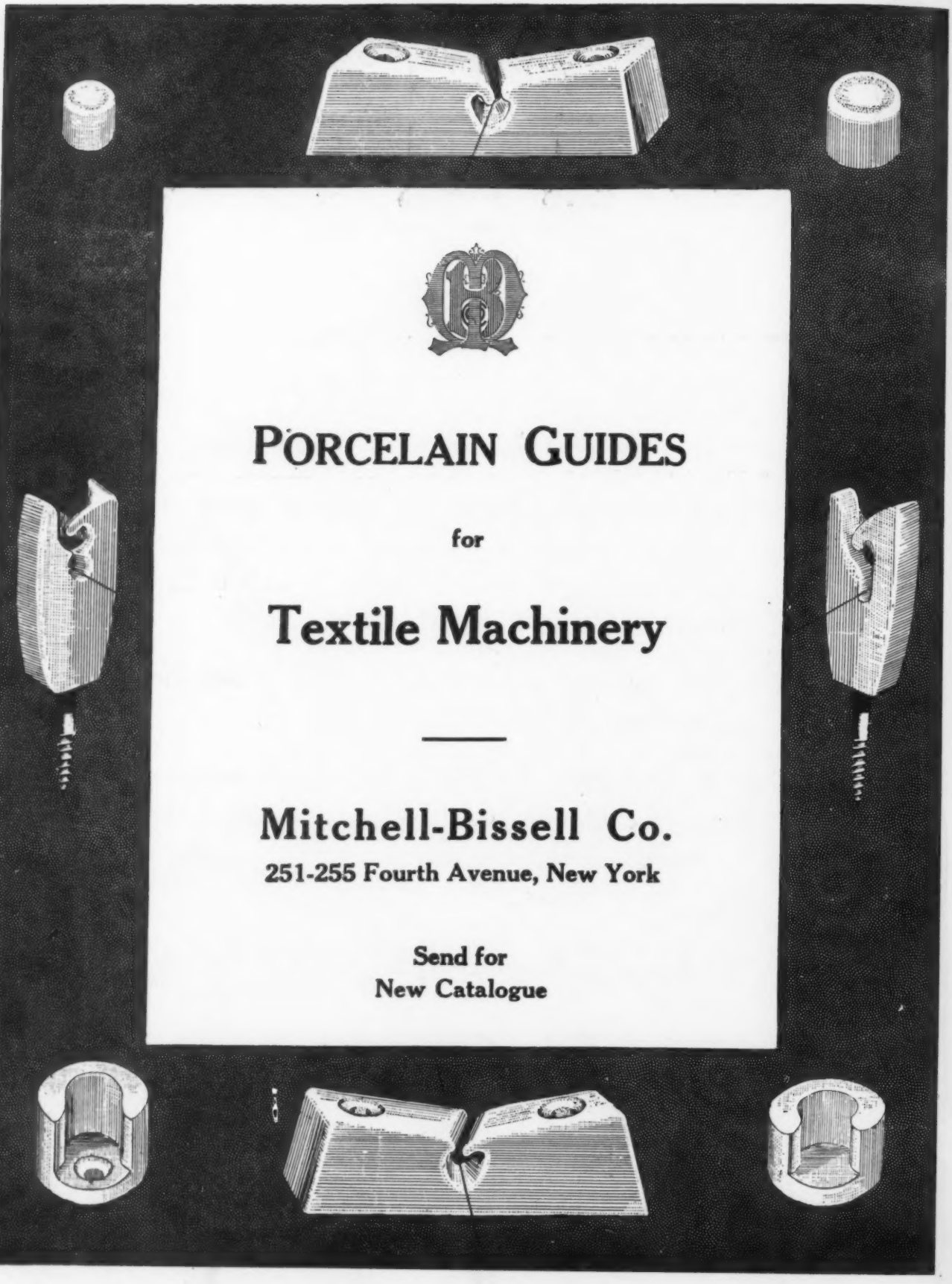

PORCELAIN GUIDES

for

Textile Machinery

Mitchell-Bissell Co.

251-255 Fourth Avenue, New York

Send for
New Catalogue

THE NORTHROP LOOM

TRADE-MARK REG. U. S. PAT. OFF.

meets the question of labor shortage by calling for less weavers in the weave room;

A Northrop loom weave room needs but 25 to 50 per cent. as many weavers as with common looms;

It goes far towards replacing the shortage in weave room production by its capacity to be operated without any weavers at all during the noon hour and a corresponding time night or morning;

It can be operated by less experienced help than the common loom;

Bear in mind that the added savings in weaving high-priced cloth soon pays the increased cost of the looms compared with pre-war prices.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street Atlanta Georgia

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DU PONT ENGINEERS PROVE THE TEST

Was conducted by a number of engineers; was also witnessed and supervised by:

W. D. Owen, Electrical Engr.,
Ralph J. Coughlan, Electrical Engr.,
William Stanian, Transmission Engr.,
} E.I. duPont de Nemours & Co.

Hyatt Roller Bearings were installed in the place of 28 Ring Oiling Bearings at the Carney's Point, New Jersey, plant of the E. I. DuPont de Nemours Company. The plant was operated on a 24-hour-per-day basis all the year round. The tests that the duPont Engineering Department ran on the new and old equipment showed a saving of 14.4% under full lo d by using Hyatt Roller Bearings.

Ring Oiling Bearings consumed at f ll load . . . . . 31.3 H. P.
Hyatt Roller Bearings reduced this to . . . . . 26.8 H. P.

Saving by Hyatts . . . 4.5 H. P.
or 3360 Watts

HYATT BEARINGS

WORTH OF HYATT BEARINGS

THE SAVING

Assume that the expense in an organization the size of the duPont Company is $.013 per kilowatt hour for power, $.40 per gallon for oil and $.65 per hour for labor. The Ring Oiling Bearings were oiled once a week but the Hyatts required attention but once every 3 months. The time for oiling either set of bearings averaged 1.4 hours and the entire equipment consumed 1.5 gallons of oil at each refilling.

From the above data, the efficiency of Hyatt Roller Bearings from the standpoint of dollars and cents may be readily appreciated and is shown as follows:

Power saving.

$$\frac{3360 \text{ W.}}{1000} \times 7200 \text{ hours at } \$.013 \quad \$314.50$$

Oil and Oiling Labor Costs—Ring Oiling Bearings.

Oil 1.5 gallons X 52 weeks at $.40	$31.20
Labor 1.4 hrs. X 52 weeks at $.65	47.32
	$78.52

Oil and Oiling Labor Costs—Hyatt Bearings.

$$\frac{\$78.55 \times 4 \text{ times yearly}}{52} \quad \$ 6.04$$

Saving in Oil and Labor	**$ 72.48**
TOTAL SAVING BY USING HYATT BEARINGS	**$386.98**
Cost of Hyatt equipment, August, 1919	$654.27
Cost of Ring Oiling equipment, August, 1919	432.00
Cost of Hyatts over Ring Oiling Equipment	$222.27

RETURN ON INVESTMENT.

$$\frac{\text{Additional Cost of Hyatts}}{\text{Annual saving by using Hyatts}} = \frac{\$386.98}{\$222.27} = 174\%$$

TIME REQUIRED TO PAY FOR ADDITIONAL COST OF HYATT BEARINGS

$$\frac{\text{Additional Cost of Hyatts}}{\text{Annual Saving by Using Hyatts}} = \frac{\$222.27}{\$386.98} = \textbf{6/10 year or 7.2 months}$$

Specify Hyatt Roller Bearing Hangers — they pay for themselves.

MOTOR BEARINGS DIVISION
DETROIT, MICHIGAN

HYATT ROLLER BEARING COMPANY
INDUSTRIAL BEARINGS DIVISION
NEW YORK, N. Y.

TRACTOR BEARINGS DIVISION
CHICAGO, ILL.

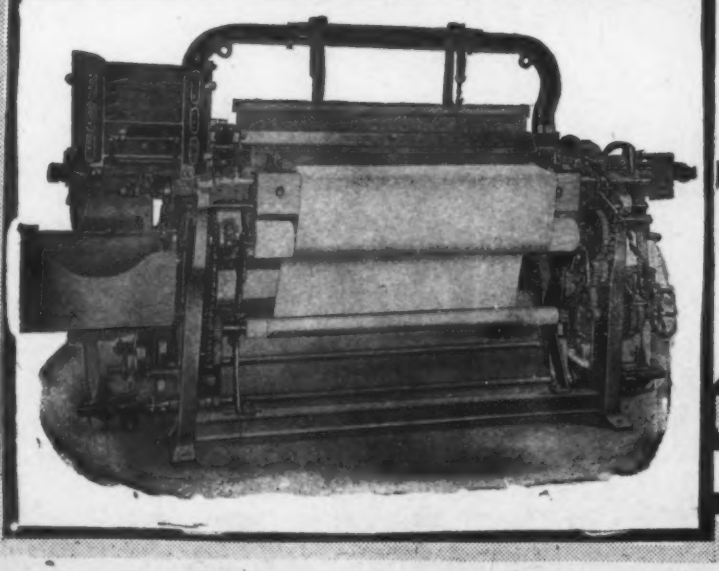
FOR LINE SHAFTS

Dependable Looms

STAFFORD DUCK LOOM

The Stafford Company has for a great many years concentrated on the production of a strictly practical loom. Convincing proof of the soundness of this idea is found in the large list of repeat orders for Stafford looms from a steadily growing list of progressive mills both in this country and Canada.

THE STAFFORD COMPANY



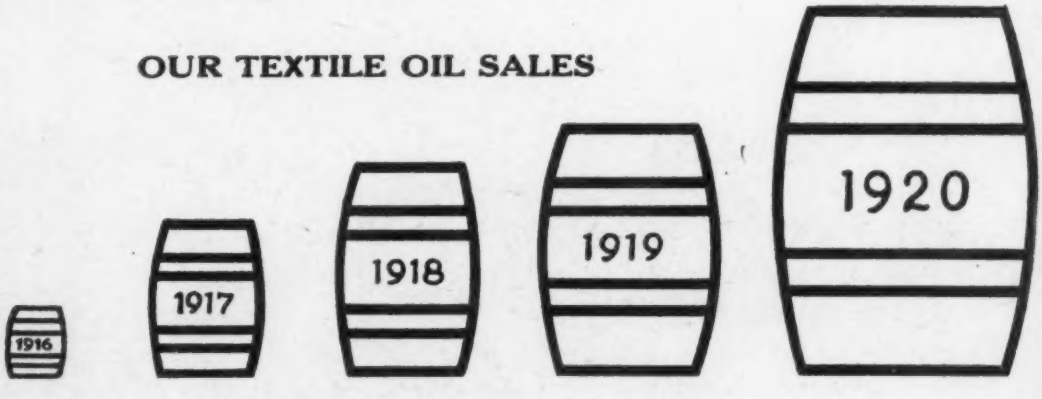
Readville
Mass.

Southern Agent
J. H. MAYES
Charlotte
N. C.

Five Years of Growth

The textile oil business of The Moore Oil Refining Company has grown steadily—as much through good report from one mill operator to another—as through our own sales efforts.

OUR TEXTILE OIL SALES

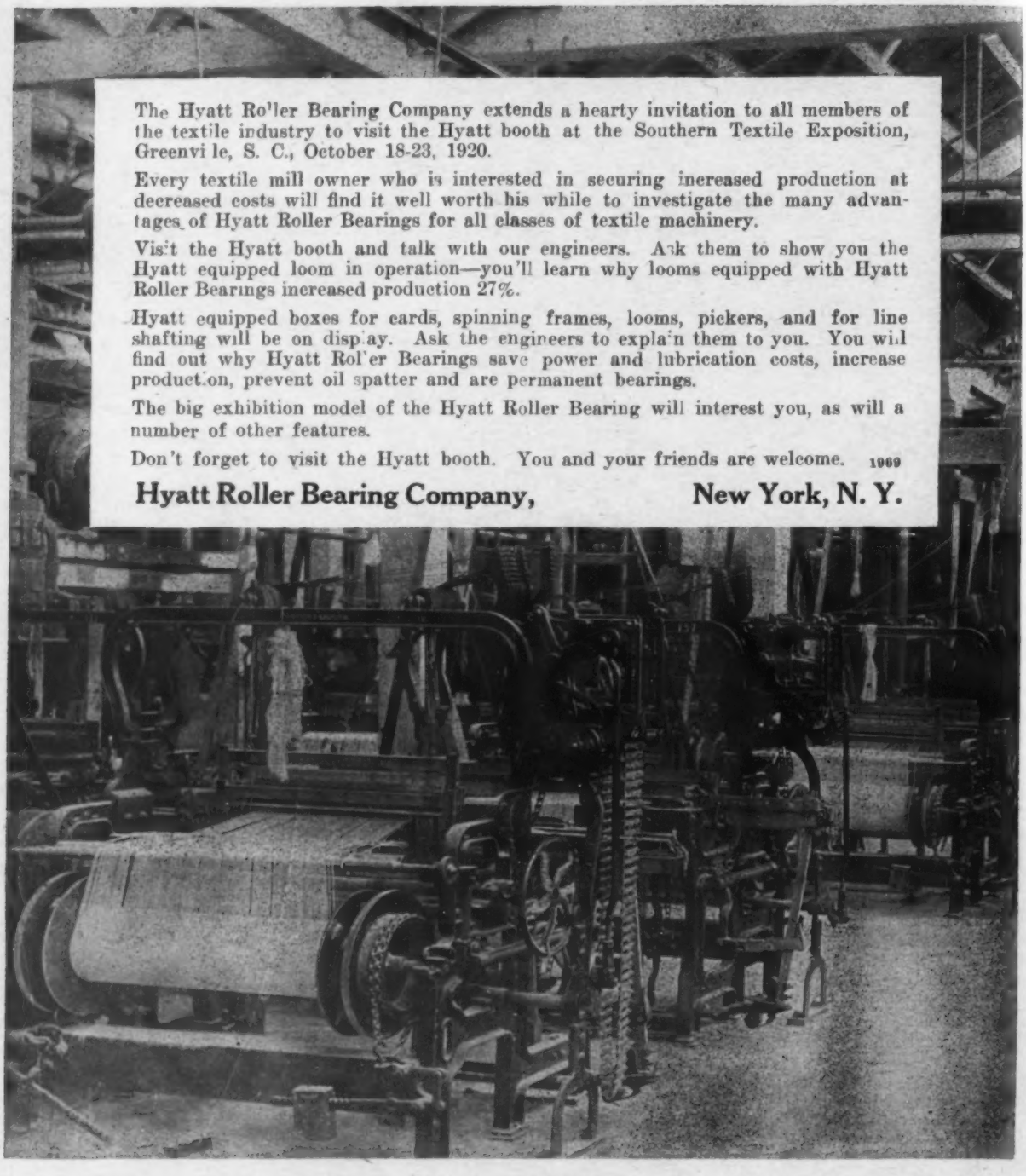


The same policies of fair dealing, genuine value, uniform products and good service will bring about the continuation of this steady growth. We ship from New York, Philadelphia or Cincinnati.

Textile Oil Department

The Moore Oil Refining Co. Cincinnati, O.

VISIT THE HYATT BOOTH AT THE



The Hyatt Roller Bearing Company extends a hearty invitation to all members of the textile industry to visit the Hyatt booth at the Southern Textile Exposition, Greenville, S. C., October 18-23, 1920.

Every textile mill owner who is interested in securing increased production at decreased costs will find it well worth his while to investigate the many advantages of Hyatt Roller Bearings for all classes of textile machinery.

Visit the Hyatt booth and talk with our engineers. Ask them to show you the Hyatt equipped loom in operation—you'll learn why looms equipped with Hyatt Roller Bearings increased production 27%.

Hyatt equipped boxes for cards, spinning frames, looms, pickers, and for line shafting will be on display. Ask the engineers to explain them to you. You will find out why Hyatt Roller Bearings save power and lubrication costs, increase production, prevent oil spatter and are permanent bearings.

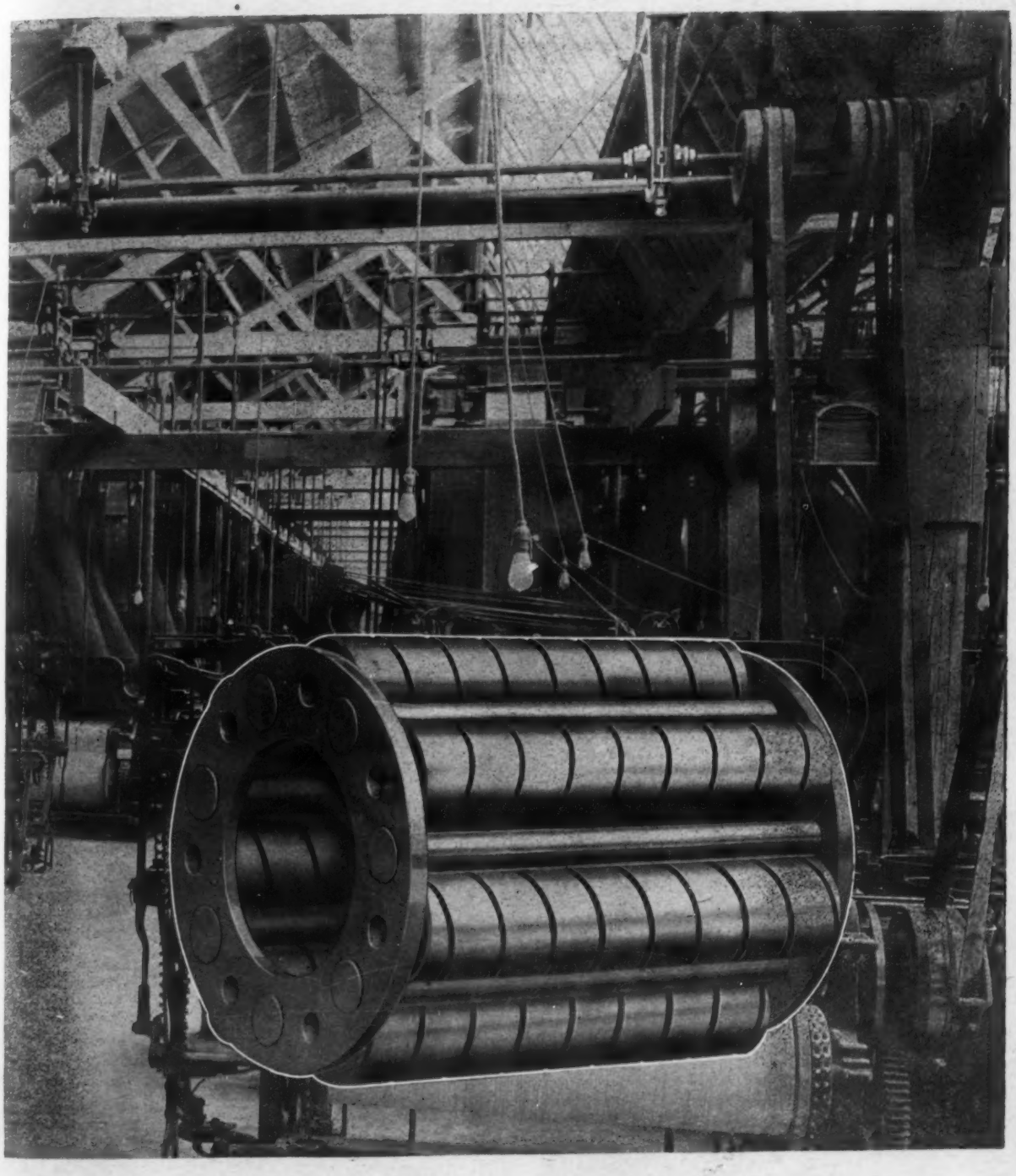
The big exhibition model of the Hyatt Roller Bearing will interest you, as will a number of other features.

Don't forget to visit the Hyatt booth. You and your friends are welcome. 1969

Hyatt Roller Bearing Company, New York, N. Y.

HYATT BEARINGS FOR

SOUTHERN TEXTILE EXPOSITION



TEXTILE MACHINERY

WHITIN MACHINE WORKS

ESTABLISHED 1831.

TEXTILE MACHINERY

Manufacturers of the Following Machines

COTTON MACHINERY

Opening
Conveying
Distributing
Picking
Revolving Flat Cards
Sliver Lap Machines
Ribbon Lap Machines
Combing Machines
Drawing Frames
Roving Frames
Spinning Frames
Spoolers
Twisters
Reels
Quillers

COTTON WASTE MACHINERY

COTTON AND WOOLEN SYSTEMS

Openers
Pickers
Willows
Card Feeds
Full Roller Cards
Condensers
Revolving Flat Cards
Derby Doublers
Roving Frames
Spinning Frames
Spoolers
Twisters

Special Spinning Frames

WOOLEN MACHINERY

Card Feeds
Full Roller Cards
Condensers
Wool Spinning Frames

WORSTED MACHINERY

Cone Roving Frames

ALSO MAKERS OF

Rolls, Rings, Spindles, Flyers, and Hank Clocks

for All Makes of

Spinning, Twisting and Roving Frames

Descriptive Catalogues sent on application

MAIN OFFICE AND WORKS

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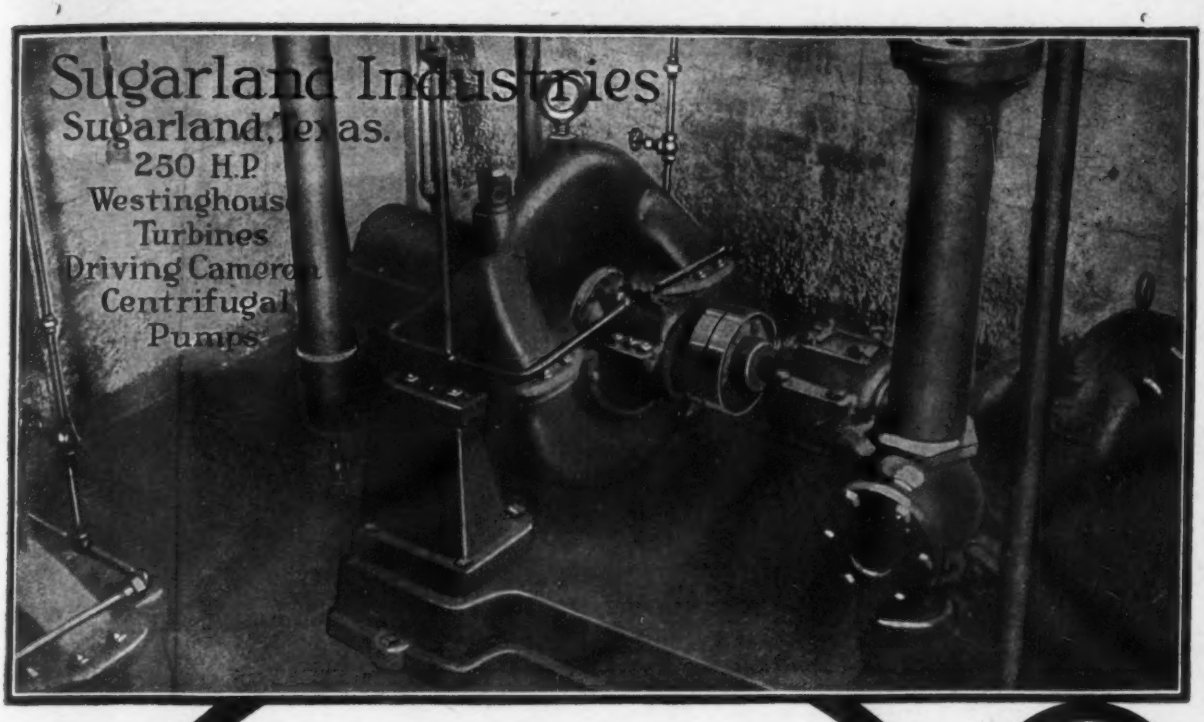
SOUTHERN OFFICE CHARLOTTE, N.C.



"A Chip Off the Old Block"

As a user of small turbines it is important to know that the troubles common to most small turbines have been prevented by embodying in the design of the small turbine those features which have contributed to the success of Westinghouse large units.

One of these features is that of leaving off the turbine feet and of supporting the turbine casing at the center line, thus obtaining a uniform and even extension of the casing in all directions without in any way disturbing the alignment of the turbine and drive shafts.

Leaflets 3867-A and 3869-A, fully describing our small turbine designs, will gladly be mailed upon request.

Westinghouse Electric & Mfg. Co.

East Pittsburgh, Pa.
Sales Offices in All Large American Cities.

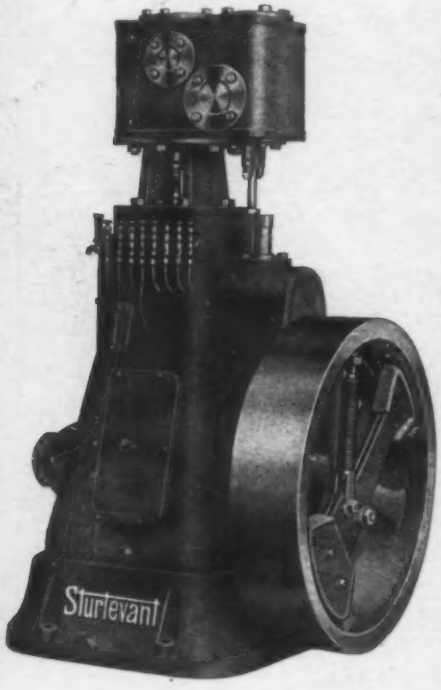
W
WESTINGHOUSE ELECTRIC

Westinghouse

BLANKETS T

Sturtevant Apparatus • Sturtevant Eng

(REG. U. S. PAT. OFF.)



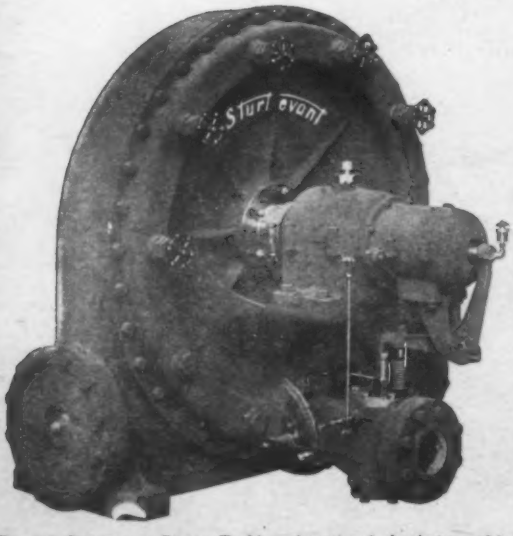
VS-7 Steam Engine showing sight oil feeders of gravity oiling system

Steam Engines

Designed to U. S. Navy specifications, the most exacting in the world. Unexcelled in reliability. Give stellar service under all conditions. Good steam economy and close speed regulation. Built either with gravity or with forced feed lubrication, as conditions require. Used for direct connection to blowers, fans, generators and for independent power service, automatic or throttling. Every engineer will be interested in the many distinct features of their design. Write for catalogue No. 239.

Steam Turbines

Particularly adapted to driving Sturtevant Fans and Blowers, pumps, generators and other auxiliaries with the minimum in steam consumption, attention and repairs. Built with solid rotors with individually controlled nozzles having internal reverse buckets to insure the most efficient absorption of the steam velocity. Unsurpassed in close speed regulation and in protection against over-speed. Ask for our new catalogue No. 256.



Type 6 Sturtevant Steam Turbine (unretouched photograph)

Generating Sets

Whether steam turbine, steam engine or gasoline engine driven, Sturtevant electric generating sets comprise every qualification to render the maximum of efficient service. Unsurpassed in operating economy by any units in their class. Write for bulletins.

Wherever You

Sturt

REG. U. S.

the high quality of the product is assured. It symbolizes the best engineering practice in design and construction of Fans, Blowers, Turbines, Engines, Economizers and other power apparatus that has been the outcome of over 60 years' experience.

To assist prospective purchasers 22 Sturtevant Engineering service stations are

22 Sturtevant Engineering Service Stations conveniently located thruout the country

LIST OF

Blowers and Exhausters
134-Steel Pressure Blowers
242-Monogram Blowers and Exhausters
228-Multivane Fans: Design 3
238-Multivane Fans: Design 3
Performance Charts
237-Ready-to-run Ventilating Sets
257-Positive Pressure Blowers

Forced Draft Apparatus
236-Forced Draft Fans
224-Turbo Undergrate blower Design 3

Fuel Economizers
150-Sturtevant Fuel Economizers

Engines
239-Vertical Single Cylinder VS 7 and VS 8

Generating Sets
239-With VS 7 and VS 8 Engines
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B. F. STURTEVA

Hyde Park, Boston, Mass.

HE COUNTRY

ineering Service - Sturtevant Systems

(REG. U.S. PAT. OFF.)

See The Name

evant

PAT. OFF.

maintained in the leading business centers of the country. A staff of Sturtevant engineers is ready to serve you promptly. Their advice is worth money—and costs you nothing.

Better get acquainted with the Sturtevant line. Send for any of the catalogues listed below.

BULLETINS

Heating and Ventilating
230-Heaters
227-Heating and Ventilating Layouts, Blue-Print Book
1011-Heating and Ventilating Factories
1013-Heating and Ventilating Public Buildings
1014-Heating and Ventilating Govt. Bldgs.
1015-Heating and Ventilating Book Complete
215-Heating and Ventilating Treatise

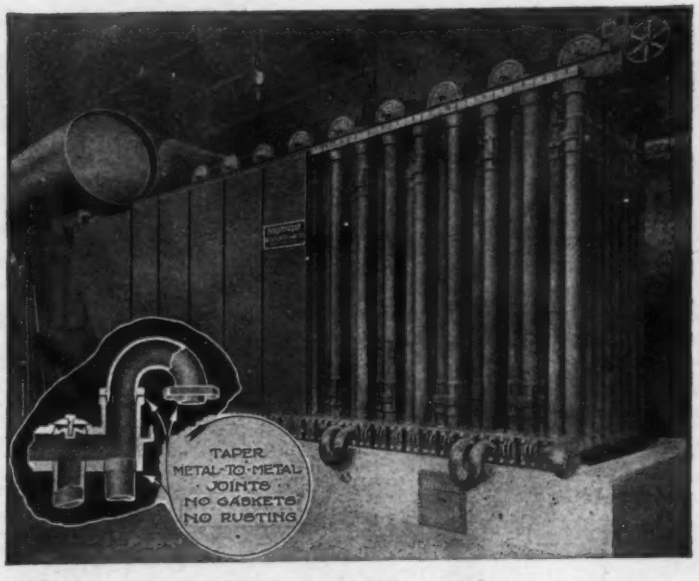
Forges 1050-Forges

Motors and Generators
217-D-G. Type D. Commutating Poles

Vacuum Cleaners
224-Stationary Vacuum Cleaners
1024-Portable Vacuum Cleaners

Steam Turbines
256-Steam Turbines

Miscellaneous
195-General Catalogue
213-Power Apparatus
225-Air Washers Type S
No. 25-Canadian Edition



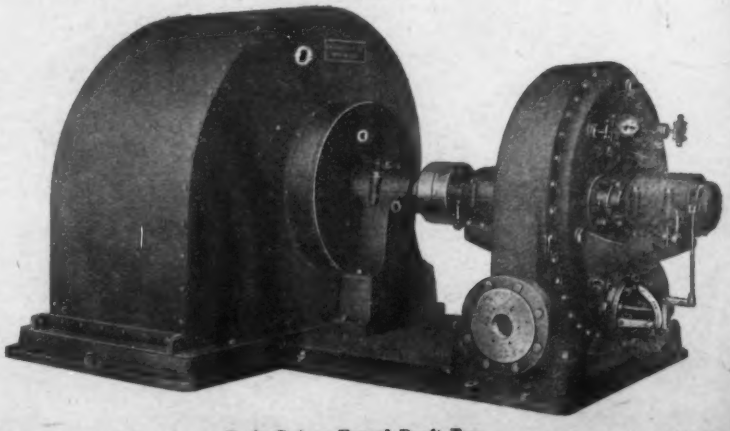
Sturtevant Economizer installation. The metal-to-metal jo'nts eliminate all use of gaskets, packing and rusting; staggard pipe construction insures high feedwat.r temperature.

Fuel Economizers

At a lower operating and repair cost the highest feed water temperature is assured. Large fuel savings effected. Boiler life prolonged—capacity increased. Smoke nuisance relieved. Two supreme Sturtevant features are the staggard pipe construction and the tapered metal-to-metal joints (see the illustration) which eliminates use of all gaskets, packing and rusting. Withstand 300 lb. pressure. Request catalogue No. 150.

Mechanical Draft

The supremacy of Sturtevant induced and forced mechanical draft apparatus-engine, turbine or belt driven—embrace the refinement and perfection derived from 60 years of "knowing how" in the construction, as world leaders, of fans, fan systems and related products.



Turbo-Driven Forced Draft Fan

NT Company

Branches in All Principal Cities

THE

SACO-LOWELL SHOPS

BUILDERS OF

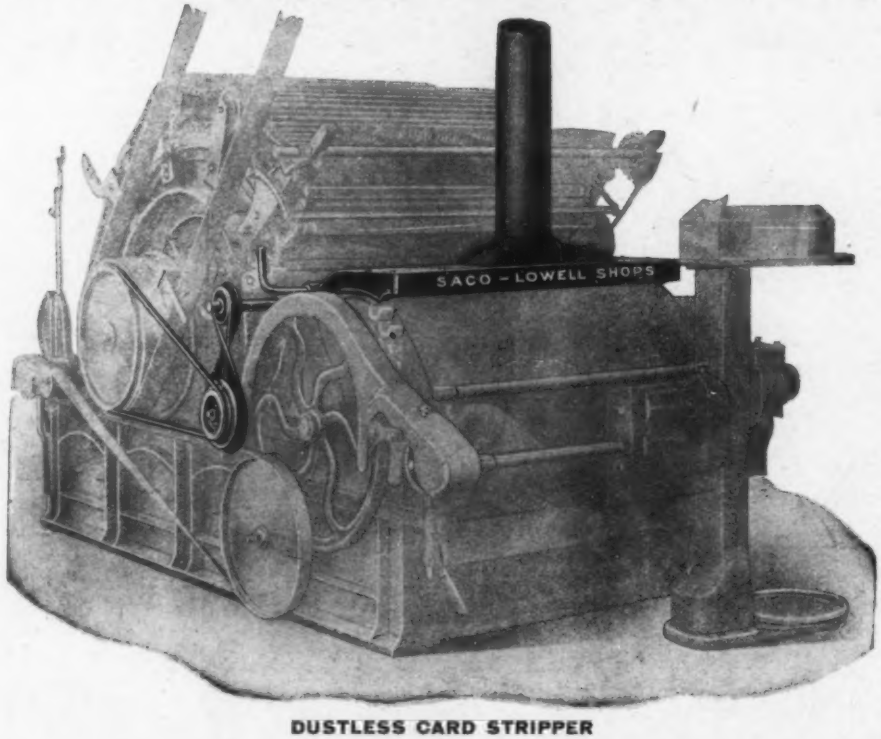
IMPROVED TEXTILE MACHINERY

Executive Offices, Boston, Mass.,

WILL EXHIBIT AT THE

Southern Textile Exposition

TO BE HELD AT GREENVILLE, OCTOBER 18-23.



DUSTLESS CARD STRIPPER

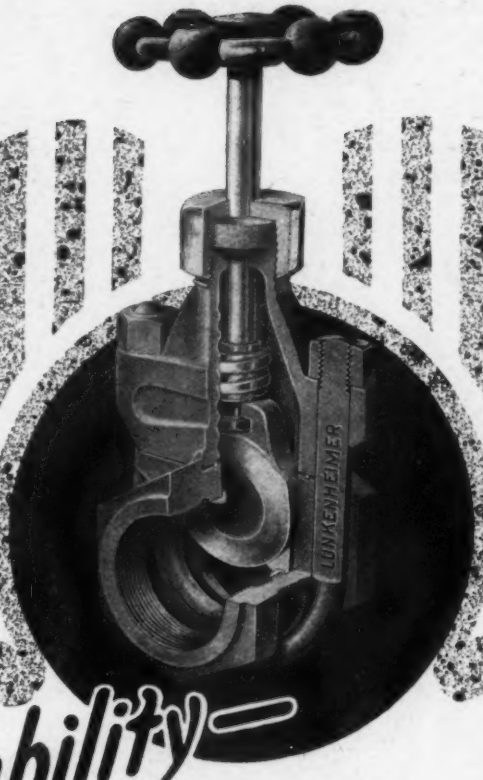
We will have in operation in addition to our

DUSTLESS CARD STRIPPER

A Revolving Flat Card, Spinning Frame and Twister

A cordial invitation is extended to all.

ROGERS W. DAVIS, Southern Agent, CHARLOTTE, N. C.
Southern Branch Office, Greenville, S. C.



Serviceability—

Performance under every conceivable service test has made the enviable reputation enjoyed by

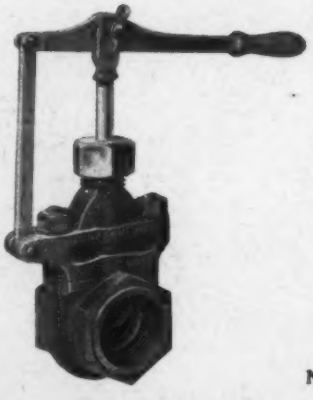
LUNKENHEIMER "CLIP" VALVES

The simplicity of their construction,—there being but few operative parts, coupled with the high grade materials used, and Lunkenheimer quality workmanship, peculiarly adapts them for service in the Textile industry.

The steel "clip" holds the body and bonnet together and adds rigidity to the valve. It also facilitates taking apart for cleaning or inspection.

Made in ½ to 6 inch sizes with screw ends and 2 to 6 inches with flange ends. Inside Screw Rising Stem and Quick-opening Sliding Stem types in iron body bronze mounted and all iron. For pressures up to 100 pounds.

Your local dealer can furnish them; if not, write us. Write for descriptive booklet No. 505—AK.



THE LUNKENHEIMER CO.

Largest Manufacturers of High Grade Engineering Specialties in the World.

New York Chicago CINCINNATI Boston London 5-12-10

The Way to Solve Labor Problems is Through the Human Heart

Practically everything in use today intended to solve the labor problem that has been found in any way successful deals with technique, is mechanical and automatic and has little to do with the human heart and thought part of the question.

Broad-minded mill executives are finding that human principles, based on human motives and followed up with human acts are the essentials if production is to be increased the way they want it.

What do we mean by "human principles, based on human motives?" Because you, the executive, understand conditions in your mill, is no reason why the workers do. Jealousy is human, and petty jealousies and misunderstandings are more prevalent in the textile mill and create more havoc and unrest than anything. Some employees maintain an attitude of "Tell Them Nothing" and some try through various sources to explain conditions to the workers, but it's like "finding a needle in a haystack" to try to reach their every little thought and misunderstanding and overcome them and satisfy them with the methods you now use. They don't appreciate a raise in wages, because they think it is only their just due—they won't listen to your explanations because it comes from you and they don't believe you, because you are the man higher up. Your foreman's executive character handicaps his efforts to reach their heart.

You've got to "get under their skin" in the **right** way—the psychological way.

Everyone agrees that scientific management is needed, but workers balk at time studies and stop watches. Welfare work, even in the highest degree, is not producing the results desired.

The only way that has been proven RIGHT—the way that in the long run has proven the most efficient with the least waste in effort, is the Sherman way, and that is why Sherman Service is being used in many textile mills today.

SHERMAN SERVICE INC.

Production Engineering
Industrial Co-ordination

New York	Chicago	Philadelphia	Boston	St. Louis
2 Rector St.	208 So. La Salle	1211 Chestnut St.	10 State St.	314 No. Broadway
Cleveland	Detroit	New Haven	Providence	Toronto
Park Building	73 [illegible] St.	42 Church St	10 Weybosset St.	10 Adelaide St. East

Largest organization of its kind in the world.
Founded April 7, 1910.

SHERMAN SERVICE

A Fair Salary and Sherman Service is the Proven Way

Sherman Service provides a practical, positive and satisfactory means of educating workers—of inoculating harmony, loyalty and desire to produce into the whole force.

You can't really and truthfully get "under the skin" of your workers by oratory, increasing salaries, putting in new contraptions, etc.—they must be reached on a level, man-to-man basis, and it is through rubbing elbows, by word of mouth, that understanding can be furthered best.

Sherman Service deals solely in viewpoints. We get at the root of every phase of trouble and misunderstanding—get into the minds of every man, study their thoughts and acts, find out why they think and do things contrary to contentment and production, and change their viewpoints into proper channels for production purposes.

Again we say, that it is only with **human principles**, based on **human motives** that reaches the understanding necessary, and this followed up with **human acts** solves the labor problem.

We survey and analyze, counsel and advise—you and your ways first, then your worker and his ways. If we find your ideas are wrong, we suggest adjustments. We get you right first, then sell you to your workers—get them thinking right, doing right, on their toes every minute working and fighting for YOU. Then the mill runs smoothly and production is increased the way you want it.

No matter what kind of plans you have, you can probably save time and money by using Sherman Service in some degree because our experience and knowledge gained through dealing in every phase of the human labor question, will be worth many times what it costs you.

Let us tell you the whole story about Sherman Service confidentially. Let us show you what we can do for you. Tell your stenographer to ask us for full information today. No obligation to you.

SHERMAN SERVICE INC.

Production Engineering
Industrial Co-ordination

New York 2 Rector St.	Chicago 208 So. La Salle	Philadelphia 1211 Chestnut St.	Boston 10 State St.	St. Louis 314 No. Broadway
Cleveland Park Building	Detroit 73 State St.	New Haven 42 Church St.	Providence 10 Weybosset St.	Toronto 10 Adelaide St., East

Largest organization of its kind in the world.
Founded April 7, 1910

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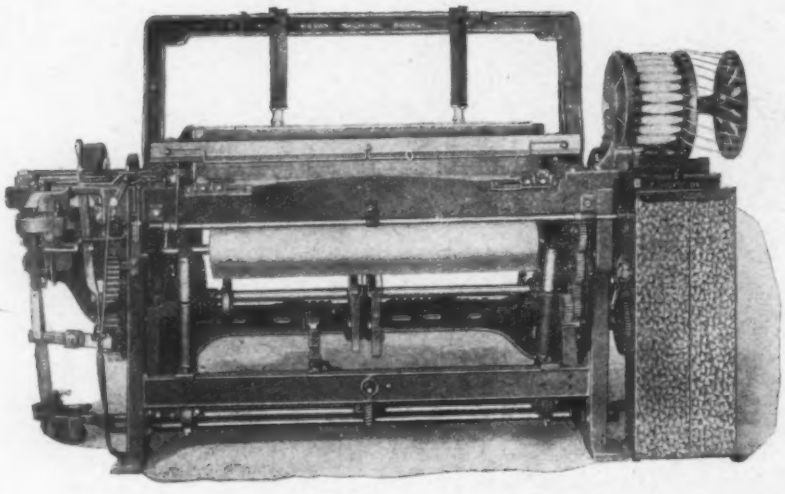
SHERMAN SERVICE



Mason Automatic Loom

With Battery, Warp Stop Motion, Feeler and Shuttle Lock

RANDOLPH CROMPTON'S PATENTS

Fewer Parts Standard Construction Rebounding Shuttles Overcome

Damage to Shuttles and Bobbins Prevented

WE ALSO BUILD

REVOLVING FLAT CARDS.

DRAWING FRAMES.

RING SPINNING FRAMES.

DUCK LOOMS in various widths and weights.

SILK LOOMS—Single Box and Two Box.

WIDE SHEETING LOOMS.

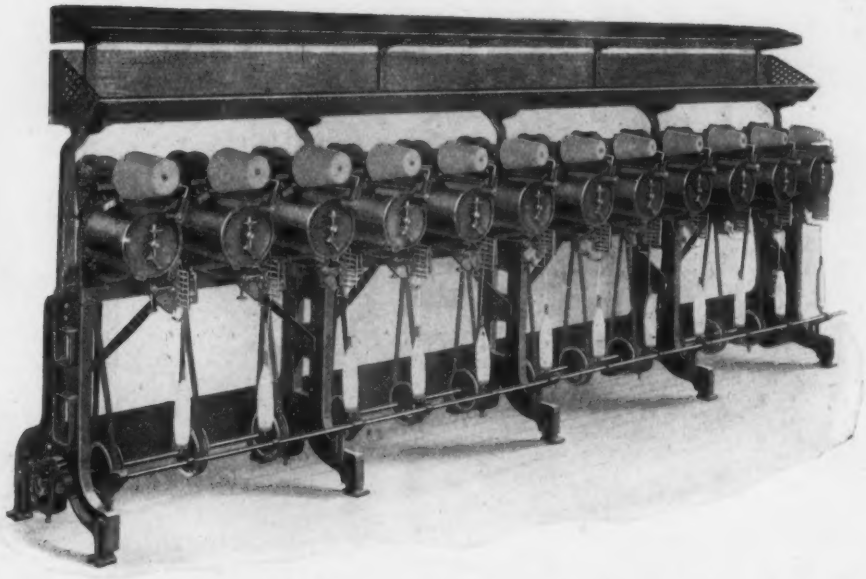
Mason Machine Works

Taunton, Mass.

E. HOWARD, Southern Agent

GREENVILLE, S. C.

A NEW FOSTER MACHINE



The Model Forty Precise Wind Cone and Tube Winder.

Suitable for all warps and plied yarns, wrapping twines and small cordage requiring close or precise wound packages.

Designed for different classes of work from our Models 12 and 30 Open Winding Machines.

High Speed **Self-Lubrication** **Quick Threading**

THE USUAL STURDY FOSTER CONSTRUCTION

FOSTER MACHINE COMPANY

WESTFIELD, MASS.

BUY THE BEST!
Buy
"Leatheroid"
RECEPTACLES

Constructed of superior fibre—Smooth Finish—Best for service and for standardization of your mill equipment.

WE INVITE YOUR INSPECTION OF LEATHEROID RECEPTACLES AT THE GREENVILLE EXPOSITION

Booths Nos. 301, 302, 303 and 304

This is a standard box for mills, strong and well constructed.

☛Note the new steel corners protecting.

"LEATHEROID" NO. 1 SEAMLESS ROVING CAN

Patented "Leatheroid" rolled top, rolled in and under two and one-half times, having no steel rim underneath the roll to break the can. Solid steel bottom, steel chime, 6 in. kicking band. 10 x 36. 12 x 36.

"LEATHEROID" FACTORY BOX NO. 3

"LEATHEROID" NO. 2 SEAMLESS ROVING CAN.

Latest improved construction, polished steel metal top rim, solid steel bottom, steel chime, 6 in. kicking band. 10 x 36. 12 x 36.

Other sizes riveted.

SOLD BY THE
Leading Southern Mill Supply Houses

"LEATHEROID" NO. 3 MILLHOUSE CAR.

Standard Sizes:
32 x 18 x 18 — 42 x 24 x 28
36 x 24 x 24 — 48 x 30 x 30

"LEATHEROID" COMBINATION DOFFING CAR.

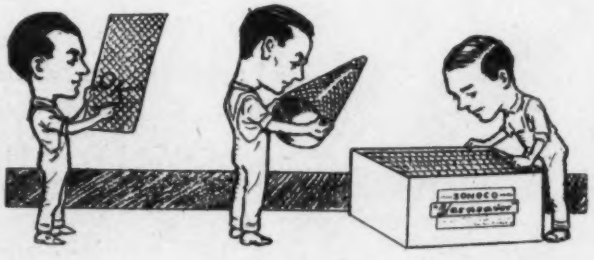
Stationary Box 12 x 12 x 18
Loose Box 18 x 12 x 18
Many other sizes.

"LEATHEROID" STEEL-CLAD NO. 2 CAR.

Standard Sizes:
32 x 18 x 18 — 42 x 24 x 28
36 x 24 x 24 — 48 x 30 x 30

Rogers Fibre Company
Leatheroid Sales Division

1024 Filbert Street, Philadelphia



Unvarying Accuracy

"SONOCO"
TRADE MARK REG. U. S. PAT. OFF.
SOUTHERN NOVELTY CO.
HARTSVILLE, S. C.

Dependable Deliveries

Cones and Tubes

Write for prices!

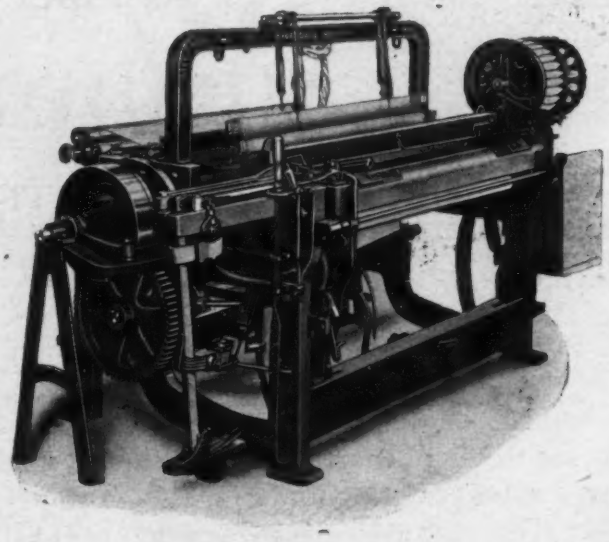
Practically all of the space for the Fourth Southern Textile Exposition at Greenville, South Carolina, October 18th to 23rd, has been sold.

Greenville will accommodate visitors comfortably in private homes when the hotels overflow, if applications are made in advance to the Housing Committee.

Greenville Association of Commerce has arranged informal entertainments complimentary to members of Southern Textile Association and the Exhibitors.

You are cordially invited to be present.

Southern Textile Exposition, Inc.
Greenville, South Carolina

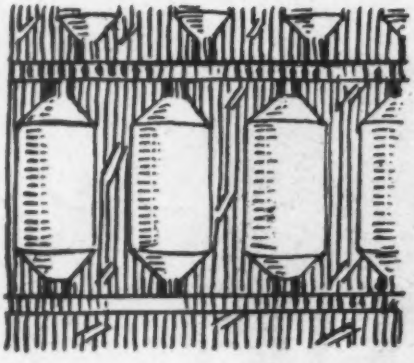


WE exhibited the first complete automatic loom of our own manufacture at Greenville in May 1919.

We show several like the **THOUSANDS ORDERED SINCE** at this October 1920 Greenville Exposition.

Hopedale Manufacturing Co.

Milford, Mass.



The Place of HUMIDITY IN COTTON MANUFACTURING

No 4. Roving

In the Roving department, the fibres begin to undergo the first twisting and a gradual drawing-out process. This manufacturing operation is aided by somewhat high humidity. An average will probably be from 6 per cent to 7 1-2 per cent R., and this represents humidities of from 45 per cent to 58 per cent.

Here again variations must be made in individual cases to allow for differences in fibre, speeds, drafts, twists, and other things of that kind. The primary object in this as in other manufacturing steps is to furnish as good a preparation for the next step as possible.

Skillful manipulation in this department, with scientific application of humidity make for a roving product that helps materially in the next.

Profit by "High Duty Climate"

Parks-Cramer Company

Engineers & Contractors

Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte

U S BOBBINS are made right, by men with long experience and knowledge as to just what the highest-class mills desire. They are stronger, lighter, and absolutely smooth and true. Our new system of testing every Bobbin on your own spindles eliminates any that do not run true.

The "STETSON" Hand-Threading Shuttle is another one of the famous U S products. This is the best exponent of the hand threading type of shuttle that has ever been presented to the textile trade. You have only to try them to be convinced of their superiority.

We also make shuttles for Draper, Stafford and Crompton & Knowles Looms, and would be glad to furnish samples upon request.

We make a specialty of rolls, especially for the Universal and Foster Winders; also Underclearer Rolls, plain and covered, Comber Rolls, Drawing Rolls, etc.

Every one of the U S Products have quality of the highest character, and they are saving hundreds of mills time and money wasted by frequent changing and purchasing.

WE AIM TO PLEASE.
Write today for Catalog.

U S B & S Co. PRODUCTS

BOBBINS
SHUTTTLES
SPOOLS
- Marquette
- Drawing
- Warper
- Twister
- Jack
- Silk
- Belting

BEAMS
- Rubber
- Cotton

SPEEDERS
SKEWERS
WARP
- FILLING

CAP SPINNING
FLAX SPINNING
TWISTERS
TRIPTODS
QUILLS
ROLLS
- Comber
- Underclearer
- Drawing
- Winder

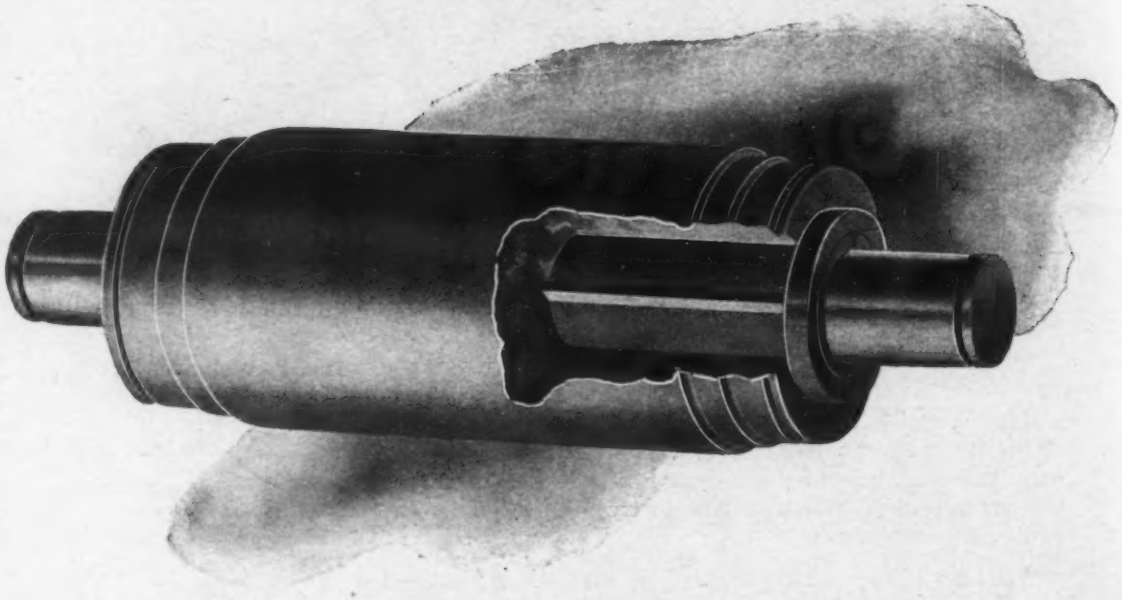
Our New "S." Automatic Shuttle
Most successful Automatic Shuttle on the Market.

U S BOBBIN & SHUTTLE CO.

PROVIDENCE, R. I.
LARGEST BOBBIN AND SHUTTLE MANUFACTURERS IN THE WORLD
EIGHT FACTORIES

PERKINS CALENDER ROLLS

"RESISTANT BUT RESILIENT"



You will never know real Roll satisfaction until you have used Perkins Guaranteed Calender Rolls.

The line includes PAPER ROLLS, HUSK ROLLS, COTTON ROLLS, and COMBINATION COTTON and HUSK ROLLS.

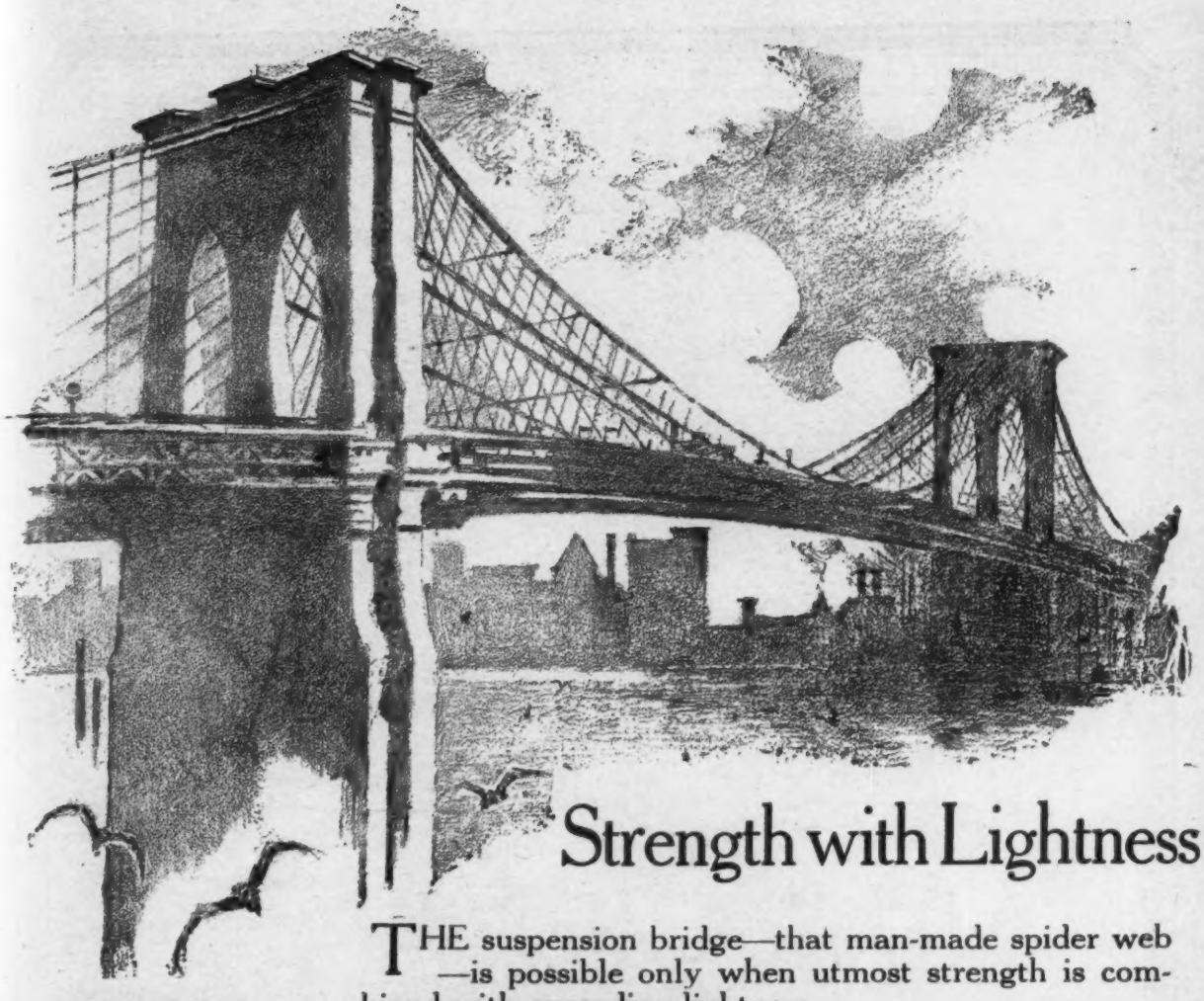
Every Roll is fitted with a Perkins Patented Spline which prevents slipping or turning on the shaft. The patented mechanical filling process insures uniform density which it is impossible to attain in hand filled Rolls.

Back of these Rolls is an experience of more than thirty years.

Ask for Details.

B. F. PERKINS & SON, Inc.

HOLYOKE, MASS.



Strength with Lightness

THE suspension bridge—that man-made spider web—is possible only when utmost strength is combined with exceeding lightness.

The greatest efficiency of all material used in industry that combines these two elements is evident.

KEYSTONE "PEERLESS" SEAMLESS ROVING CANS

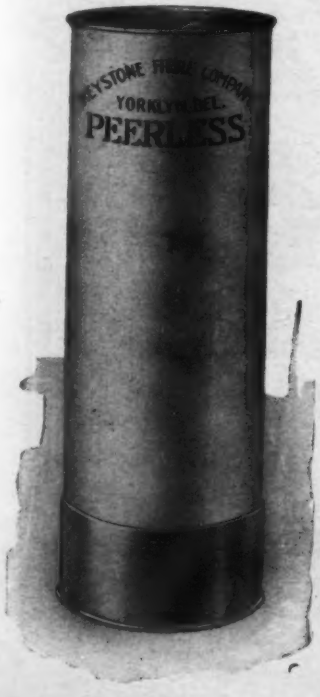
are light, easy to handle—yet unusually tough and strong.

We make our own fibre. Our exclusive manufacturing methods result in a fibre of maximum strength with minimum weight.

Keystone Fibre will outlast any other fibre twice as heavy.

Your mill supply house has them.

Write for our book on Keystone Hollowware Mill Equipment.

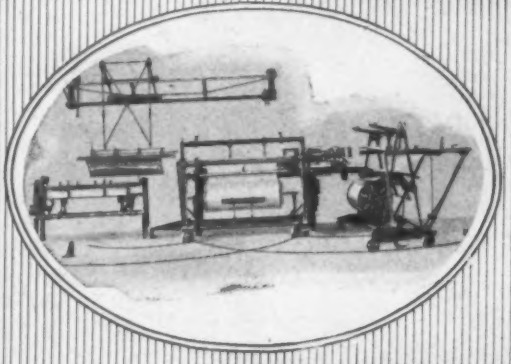


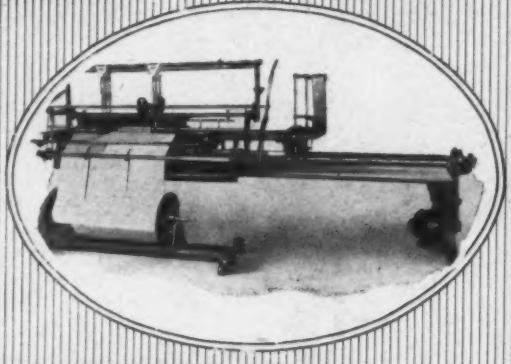
Keystone Fibre Company

Box 141-C, Yorklyn, Delaware

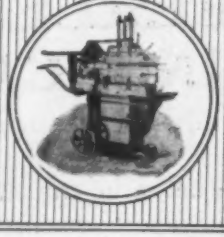
BARBER-COLMAN

WARP TYING & WARP DRAWING MACHINES
HAND KNOTTERS





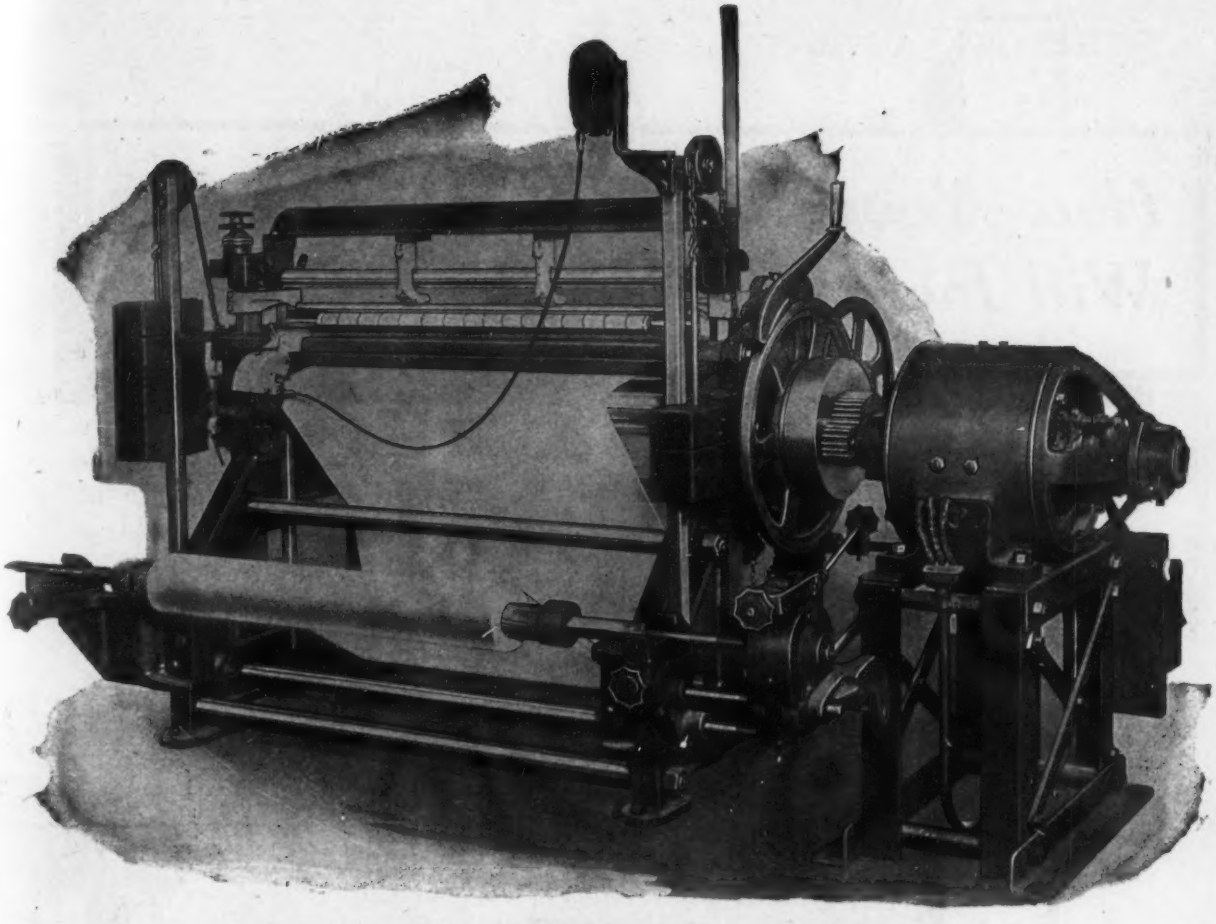
THE HOME OF BARBER-COLMAN
PRODUCTS VIEWED FROM AN AIRPLANE



BARBER-COLMAN COMPANY
HOME OFFICE & PLANT
ROCKFORD, ILL., U. S. A.

BRANCH
BOSTON, MASS.

BRANCH
GREENVILLE, S.C.



CAMERON

SLITTING AND REWINDING MACHINE

for converting wide webs into firm rolls of strip

The enormous demand for material in the form of strip in rolls or coils has made the Cameron Principle Slitting and Rewinding Machine an important part of the textile manufacturer's equipment. If one considers only briefly, the many uses for strip or tape cut from broad webs of various materials, the list would be a very long one indeed. Manufacturers of flags, automobile tires, typewriter ribbons, canvas belting, carriage and auto tops, upholstery, surgeons' bandages, manufacturer of electrical insulation, tape, corset manufacturers and the immense requirements of the manufacturers of clothing, shoes, underwear, bindings and trimmings make the Cameron Machine a profitable investment for the up-to-date textile mill man. The market for goods furnished in this form seems to be unlimited.

The Cameron Machine can be hooked up to your present machine and is capable of converting over ten thousand yards of wide fabric into strips, per day.

Let us send you interesting particulars, catalog and other literature.

Cameron Machine Company

57-61 Poplar Street, Brooklyn, N. Y.

How Your Mill Village Laundry Will Increase Your Production---

WITH a mill village laundry, you can ADD the working days which you have had to DEDUCT owing to the fact that your workers have been compelled to stay at home and do their washing and ironing. Figures prove that about 300 days' labor is lost each week in the average mill—that's 15,600 DAYS THAT CAN BE SAVED EACH YEAR!

Install a mill village laundry and do the work AT COST—handle **all the washing**—household pieces as well as coats, aprons and uniforms. But be sure to arrange to IDENTIFY everything, so that nothing will be lost or misplaced. Our "National" equipment **insures** the return to each worker of EVERY PIECE **handled in your mill village laundry.**

Illustration Shows Our Improved No. 8 National Power Marking Machine

which marks all articles neatly and indelibly. Write us **TODAY**—we will advise you regarding a Mill Village Laundry.

National Marking Inks—best for all marking purposes.

TEXTILE DEPARTMENT OF

The National Marking Machine Co.

1068 Gilbert Ave. **General Offices** **Cincinnati, O.**

New York Office: 40-44 West Fourth St., New York City.

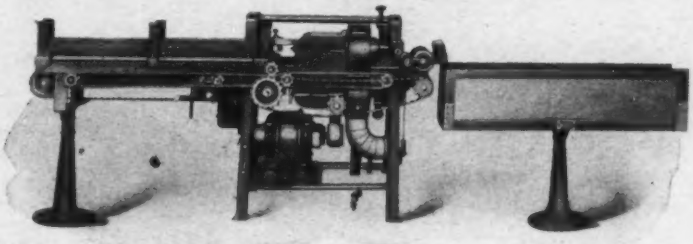
Boston Office: 100 Boylston St., Room 723, Colonial Bldg.

Chicago Office: 707-8 Cambridge Bldg., 160 N. Wells St.

Philadelphia Office: 126 N. 10th St.

Save Your Reeds

IT is true that good weaving cannot be done with dirty, rusty or scratched reeds; but why discard them on account of shuttle and temple marks or other abrasions?



The Automatic Reed Cleaning and Polishing Machine

not only smooths the face of the reeds, but cleans and polishes between the splits.

THIS machine requires no operator, and it has proved a highly paying investment in the many mills where it has been installed.

PATENTED in the United States and in foreign countries.

Manufactured by

Shawmut Engineering Company

179-195 Freeport Street, Boston, Mass.

Manufacturers of Novel Textile Appliances
Designers and Builders of Special Machinery

Southern Agency

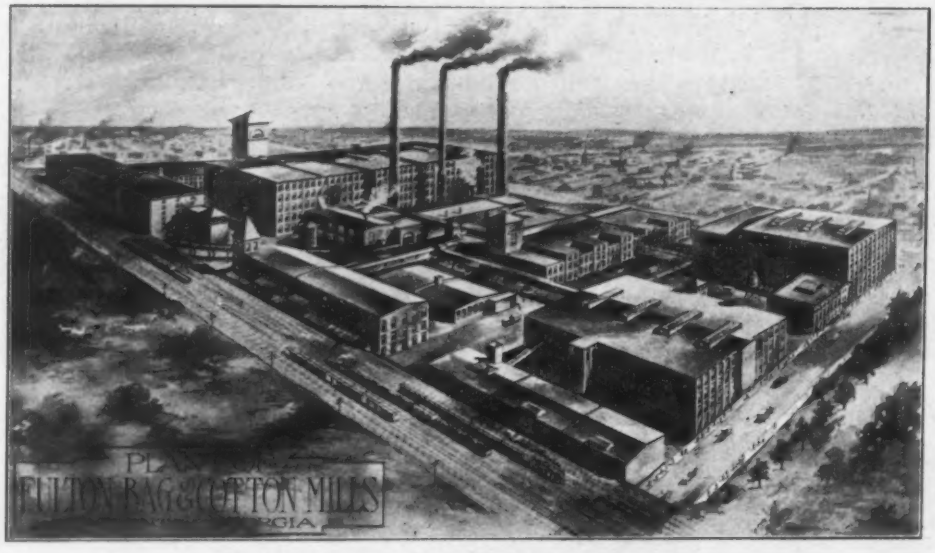
Atlanta Harness and Reed Manufacturing Company

123 Walker Street, Atlanta, Ga.

You are cordially invited to SEE OUR DISPLAY of this machine at Space 158, Southern Textile Exposition

"Sirocco"
TRADE MARK

In Southern Cotton Mills



One of the Southern Mills using "A B C" Equipment

Getting the Most From Production

Is your production keeping pace with your demands? Are your workers giving you the kind of assistance which sends the orders flowing like a stream to your shipping room?

If you would check up on the cause of lack of production in many textile plants today you would find it is due in a big extent to lack of consideration of the workers' needs and better working conditions. The plant which is properly ventilated is a big step in the right direction. You can get more from employees who work where the air is fresh and pure than can ever be possible in the poorly ventilated plant.

Our business is supplying equipment which insures fresh clear air and the heating and ventilating of industrial plants and public buildings. Our experience enables us to work with you in properly planning the right ventilation for your plant.

If you are interested why not get in touch with us?

American Blower Company

DETROIT, MICH.

INVARIABLY

INDUSTRIAL PLANTS ARE ENVEIGLED INTO PURCHASING MOTION PICTURE EQUIPMENT THAT IS TOTALLY UNFIT AS WELL AS UNSAFE FOR THEIR PURPOSE.

MOVING PICTURES

WHEN PRESENTED PROPERLY ARE OF VAST IMPORTANCE TOWARD KEEPING YOUR EMPLOYEES SATISFIED. THEY ARE ENTERTAINING AS WELL AS EDUCATIONAL.

SIMPLEX PROJECTORS

ARE PARTICULARLY ADAPTABLE FOR COTTON MILLS ON ACCOUNT OF THEIR EXTREME **SIMPLICITY, DURABILITY** AND **SAFETY FEATURES.** BEFORE PLACING YOUR ORDER IT WILL PAY YOU TO LET US SHOW YOU THE SUPERIOR POINTS OF THE **SIMPLEX**—THE ADMITTEDLY PERFECT PROJECTOR THAT THE MAJORITY OF THE WORLD'S FINEST THEATRES, MANUFACTURING PLANTS, Y. M. C. A.'S, SCHOOLS AND CHURCHES ARE USING.

BUT A FEW INDUSTRIAL PLANT INSTALLATIONS MADE BY US:

Fulton Bag and Cotton Mills, Atlanta, Ga.
Interstate Cotton Mills, LaGrange, Ga.
Interstate Cotton Mills, Hogansville, Ga.
Aluminum Company of America, Maryville, Tenn.
Langdale Mills, Langdale, Ala.
Cliffside Mills, Cliffside, N. C.
Southern Textile Exposition, Greenville, S. C.
Chickasaw Shipbuilding Co., Mobile, Ala.
Bertha Mineral Co., Austin, Va.
Riverdale Cotton Mills, Riverview, Ala.
Summerville Cotton Mills, Summerville, Ga.

——OTHER NOTABLE USERS——

DuPont Powder Co., Hopewell, Va.
Goodrich Rubber Tire Co., Detroit, Mich.
Packard Motor Car Co., Detroit, Mich.
Elkhorn Coal Co., Wayland, Ky.
New Orleans Lt., & Ry. Co., New Orleans, La.
New River & Pocahontas Coal Co., Leyland, W. Va., and two branches.
Campbell Coal Mining Co., Eagan, Texas.
Campbell Coal Mining Co., Habersham, Tenn.
Consolidated Coal Co., McRoberts, Ky.
Consolidated Coal Co., W. Va., No. 1.
Winding Gulf Colliery Co., Winding Gulf, W. Va.
Wm. Cody Lumber Co., McNary, La.
Republic Coal Co., Republic, W. Va.
General Chemical Co., New York City.
Nichols Chemical Co., New York City.
Shell Oil Co. of Cal., Coalings, Cal.

ALSO

66 Regular Army Posts, a score of Army Camps and the majority of America's Finest Theatres.

LUCAS THEATRE SUPPLY CO.

ATLANTA **158 Marietta Street** **GEORGIA**

"AMERICA'S GREATEST MOVING PICTURE EQUIPMENT HOUSE"

TUEC
STATIONARY CLEANERS
TRADE MARK REGISTERED

Better Than Fans and Blowers

Made in 5 sizes to meet any requirement.

IN many textile mills and factories where formerly fans and blowers were used to protect workers from flying lint, dust and dirt produced by machines

The Tuec Suction Cleaner

has proved far more efficient and satisfactory. Instead of scattering dust and lint the TUEC *consumes* it and deposits it directly in its tank.

If you are using a fan or blower in your mill, if your janitors are wasting hours and dollars for the want of a Suction Cleaning Plant for floor cleaning and the removal of lint and dust from machinery, it will surely pay you to investigate and learn what the Tuec is doing for others.

Tuec Stationary Suction Cleaners are used everywhere—in cotton mills, textile mills, plants for the manufacture of electrical apparatus, coal pulverizing, Portland cement and rubber goods plants, wire mills, carpet mills, cereal mills, powder mills, paper box and wood working plants, printing plants, machine shops, laboratories and scores of others.

Our advisory service is complete and reliable. Write for catalog.

The United Electric Company - Canton, Ohio

New York Chicago Cleveland Toronto, Ont

It Gets the Dirt Where Dusters, Brooms and Brushes Fail.

Immediate Delivery!

Greist

Loom Drop Wires

(*Formerly Woodbury Drop Wires*)

Made of special Heddle Wire.

"Satin Finish" an exclusive process.

Used and endorsed by leading textile mills throughout the country.

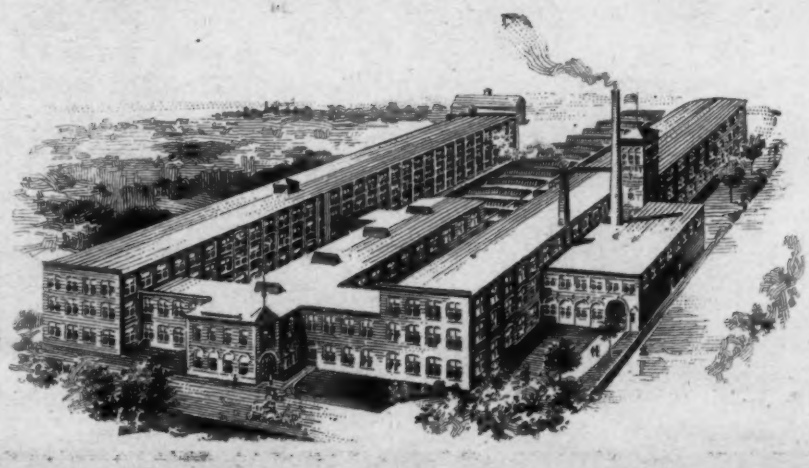
Samples upon request.

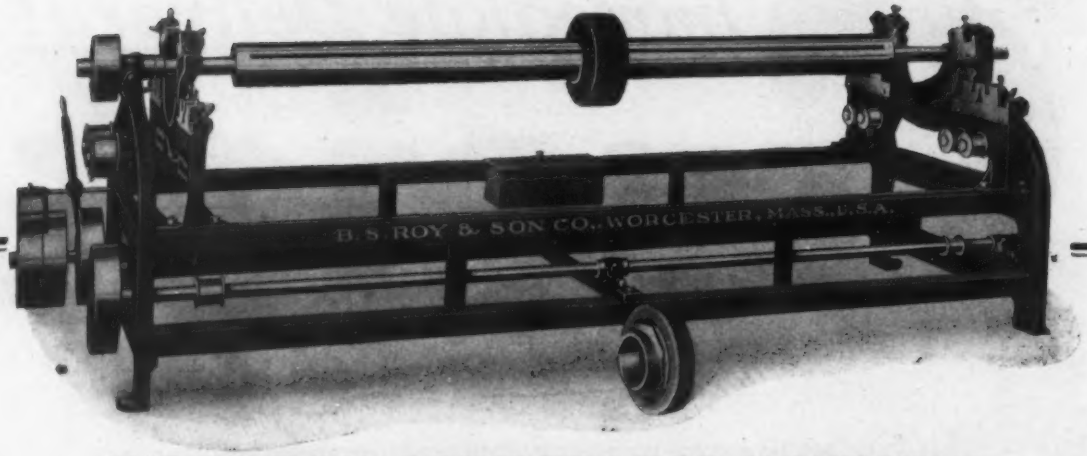
The manufacturing facilities of the Greist Manufacturing Company, since 1871 the largest manufacturers in the world of sewing machine attachments, are a dependable source of supply to rely upon.

The Greist Manufacturing Company

Dept. C.

New Haven **Connecticut**





JUDGE ROY GRINDERS FOR YOURSELF

In practically every textile mill center of the country you will find a number of Roy Grinders in use. They are well known for their ability to meet all grinding requirements and greatly help to increase production. Judge them from any standpoint—maintenance, ease of operation, durability, or by any other standard you choose—Roy Grinders will meet every requirement.

The Roy Line includes grinders for Cotton and Woolen Cards, Nappers, Garnetts and Calender Rolls. In these machines every practical means has been employed to increase their efficiency, capacity and durability.

WRITE FOR BULLETINS

B. S. ROY & SON CO., Worcester, Mass.

Established 1868

E. M. TERRYBERRY, Southern Agent, 1126 Healy Bldg, Atlanta, Ga.

THE SIMPLEST AND THE MOST ELABORATE

FABRICS

Are produced on

LOOMS

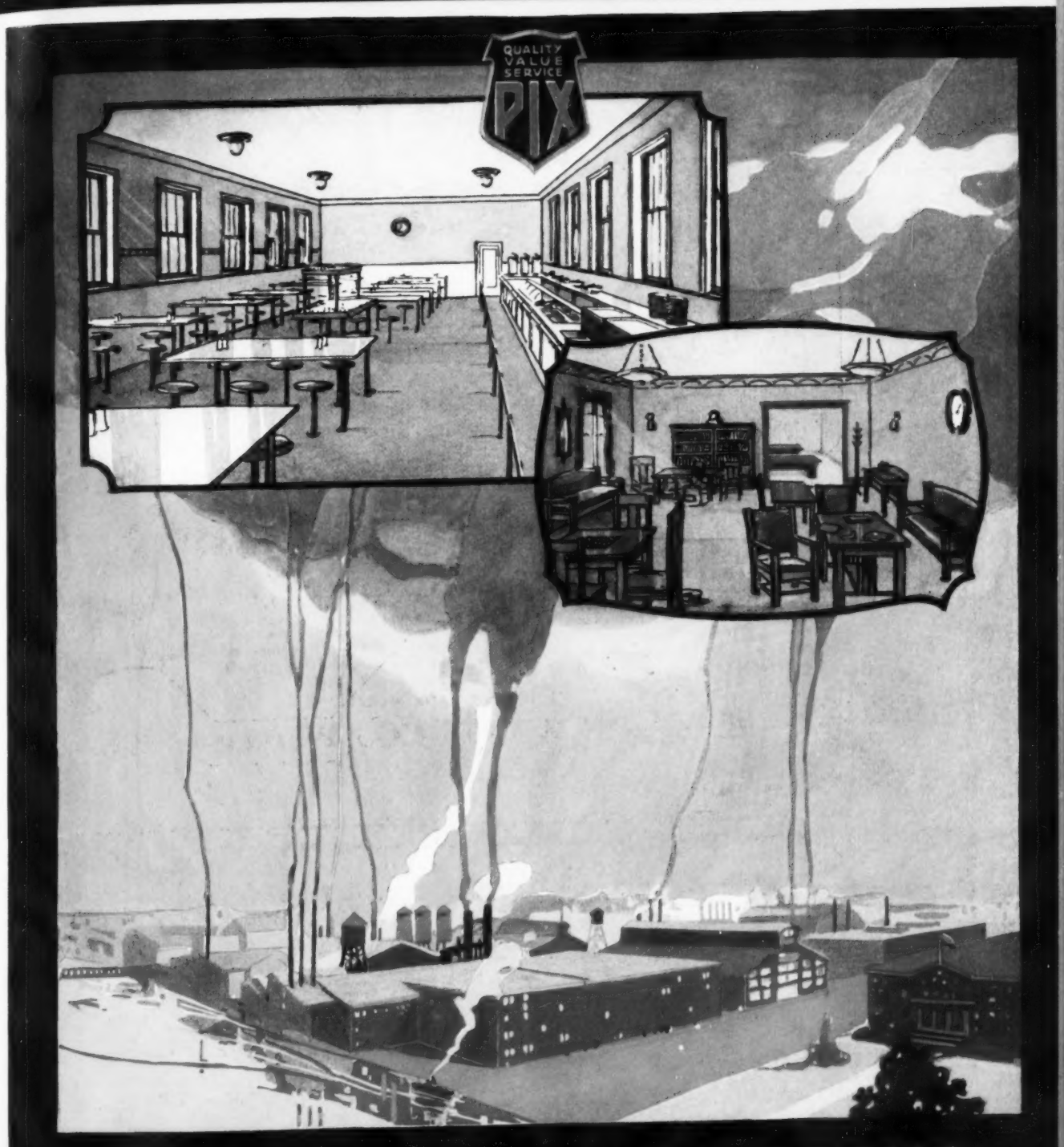
From the

Crompton & Knowles Loom Works

WORCESTER, MASS.

Providence, R. I. Paterson, N. J. Philadelphia, Pa.

Alexander & Garsed, Southern Representative, Charlotte, N. C.



INDUSTRIAL LUNCH ROOMS
REST ROOMS, INDUSTRIAL CLUBS
INSTALLED COMPLETE

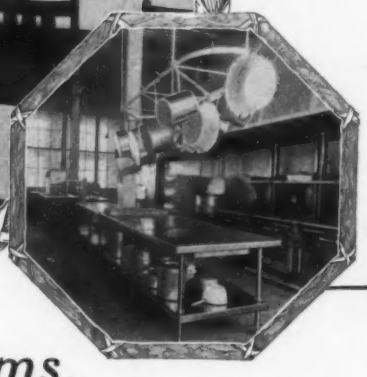
ALBERT PICK & COMPANY

208-224 WEST RANDOLPH ST. CHICAGO

Information
Supplied Promptly

Shall We Send
Our Representativ

The splendid Cafeteria of the Crouse-Hinds Co. Milwaukee, Wis.



—Everything for Industrial Lunch Rooms, Rest Rooms and Clubs

Producing Better Workers is a science of modern industry. It increases personal efficiency and augments production.

Institutions in every branch of industry have proved that Lunch Rooms, Rest Rooms and Clubs for employes pay actual dividends by increasing efficiency and reducing labor turnover. Only experts can handle the many problems of Industrial Welfare adequately and economically. As leading specialists in this field, we offer you facilities unequaled.

QUALITY
VALUE
SERVICE

We provide *everything* that goes into the modern Lunch Room, Rest Room or Industrial Club. Ours is a service by experts, who will lend to your problems the assistance and advice that make for friendly and profitable co-operation. ***Consult them freely.***

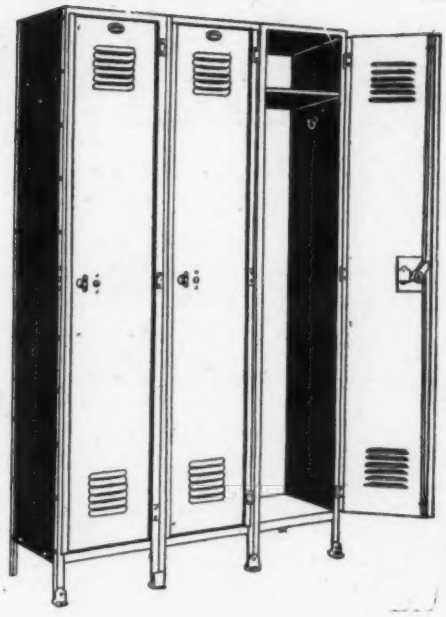
Contented employes are essential to maximum efficiency and production. Rest Rooms like this are proving highly profitable.

A comfortable corner of the Kohler American Club, where a whole building serves the welfare of employes. It was completely equipped by us.

Ask for Book S61
Industrial Lunch Rooms, Rest Rooms and Industrial Clubs

ALBERT PICK & COMPANY

208-224 WEST RANDOLPH STREET, CHICAGO, ILLINOIS



Sizes:
12 x 15 x 36 Double Tier
12 x 12 x 60
12 x 15 x 72
15 x 15 x 72
15 x 18 x 72
} Color Dark Olive
SECTIONS 3, 6, 9, 12

Steel Clothes Lockers

PROMPT DELIVERY
REASONABLE PRICES

We have just received a belated shipment of several thousand Steel Clothes Lockers.

We can now offer for prompt delivery and at less than prevailing market prices Steel Clothes Lockers until this material is exhausted.

The great demand for lockers will rapidly deplete this stock. Immediate action necessary.

Sold knocked down in crates F. O. B. Philadelphia

NEW YORK MACHINERY COMPANY

914-A Fifth Avenue Building **New York City**

HELP *your* HELP

and they will satisfy you

Provide Proper Recreation

---billiards and bowling
a clean sport

To exercise RIGHTLY *Means To PLAY!*

Bowling is the sport where you can PLAY and EXERCISE any old time —and regardless of the weather.

Let us Advise and Assist YOU in Providing

Recreation

that will

Keep YOU and YOUR EMPLOYEES

Physically Fit

Write for full information.

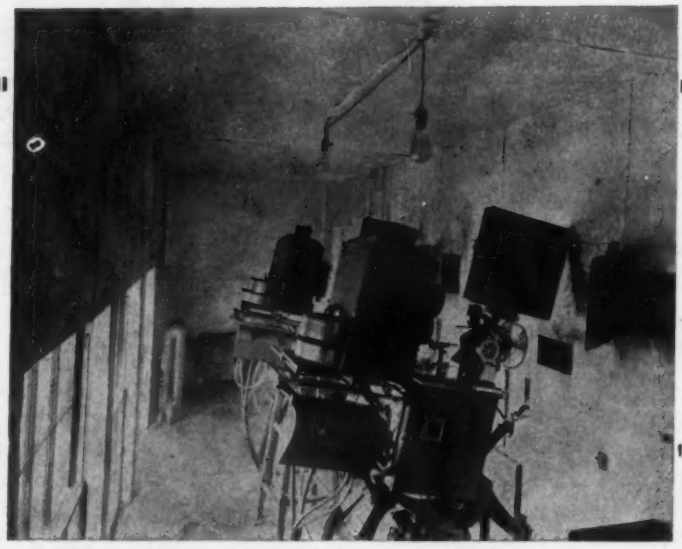
The Brunswick-Balke-Collender Co.

623-633 South Wabash Avenue
CHICAGO, ILLINOIS

Branches in All Cities

BILLIARDS AND BOWLING

Better Motion Pictures For Textile Mill Employees



Showing Installation of Power's 6 B Motion Picture Machines in the Tucupau Mills Theatre.

THE textile industry is demanding the best moving pictures for their employees, and that is why more

POWER'S PROJECTORS

are used by textile mills in the South than all other projectors combined.

Here Are a Few of the Many Mills Using Power's

Exposition Cotton Mill	Atlanta, Ga.
Bibb Manufacturing Co.	Columbus, Ga.
Bibb Manufacturing Co.	Porterdale, Ga.
Gainesville Cotton Mill	Gainesville, Ga.
Habersham Mill	Habersham, Ga.
Hillside Cotton Mill	LaGrange, Ga.
Manchester Mill	Manchester, Ga.
Milstead Mill	Conyers, Ga.
Thomaston Cotton Mill	Thomaston, Ga.
Roswell Manufacturing Co.	Roswell, Ga.
Trion Company	Trion, Ga.
Rocky Mount Cotton Mill	Rocky Mount, N. C.
Rodman-Heath Cotton Mill	Waxhaw, N. C.
Pomona Mills	Greensboro, N. C.
Cleveland Mill & Power Co.	Lawndale, N. C.
Spray Cotton & Woolen Mills	Spray, N. C.
Issaqueena Mills	Central, S. C.
D. E. Converse Co.	Glendale, S. C.
Monoghan Mills	Greenville, S. C.
Woodside Mills	Greenville, S. C.
Pacolet Manufacturing Co.	Pacolet, S. C.
Tucupau Mills	Tucupau, S. C.
Victor Mills	Greer, S. C.
Victor-Monoghan Mills	Seneca, S. C.
Victor-Monoghan Mills	Walhalla, S. C.
Victor-Monoghan Mills	Jonesville, S. C.
Ware Shoals Manufacturing Co.	Ware Shoals, S. C.
Glenn-Lowry Manufacturing Co.	Whitmire, S. C.
Lanett Mills	Lanett, Ala.
Indian Head Mills	Cordova, Ala.
Selma Manufacturing Co.	Selma, Ala.
Central Mills	Sylacauga, Ala.
Tallahassee Falls Manufacturing Co.	Tallahassee, Ala.

Our experience in Theatre Equipment is at your service

"We Have a Special Offer"

Southern Theatre Equipment Company

No. Nine Nassau St.
ATLANTA, GEORGIA

Eighteen Fifteen Main St.
DALLAS, TEXAS

Clean People Want

CLEAN FLOORS

in American Business

A few of the mills where the value of CLEAN FLOORS is recognized and the

FINNELL SCRUBBER

is used to maintain them:

Altavista Cotton Mills
Dan River Mills
Carolina Cotton & Woolen Mills
Erwin Cotton Mills
Whitney Manufacturing Co.
Dunean Mills
Tucapau Mills
Pacific Mills
Hamilton Carhardt Mills
Cannon Manufacturing Co.
Loray Mills
Wiscassett Knitting Mills
Union Buffalo Mills
Salisbury Cotton Mills
Appalachian Mills
Forstman & Huffmann
Crown Manufacturing Co.
American Thread Co.—5 Mills
Arlington Mills
Wood Mills
Shenandoah Mills
Viscose Manufacturing Co.
Aberfoyle Manufacturing Co.

To know that a hotel is CLEAN is to feel its respectability.

To know that a store is CLEAN is to consider it a reliable place to trade.

To know that an office building s CLEAN is to realize that its tenants are likely to be CLEAN business people.

To know that a factory is CLEAN is to be certain of a CLEAN product made by CLEAN, healthy employees.

Cleanliness is an index to character—of business as well as of person.

Unless the *floors* are CLEAN, the establishment is *not* CLEAN.

Thousands of executives, knowing that "CLEAN FLOORS reflect CLEAN business," and that ordinary hand methods are not consistently CLEAN, are using the Finnell System of Power Scrubbing with unusually gratifying success.

There's a right size outfit for scrubbing any kind of floor—any size, any place, any time, under any conditions.

Complete information gladly sent on application to our Chicago offices.

AMERICAN SCRUBBING EQUIPMENT CO.

Also manufacturers of Finola Scouring Powder

General Offices: 188 N. Wabash Ave., Chicago Factories: Hannibal, Mo.

DISTRICT OFFICES

ATLANTA	BUFFALO	DENVER	LOS ANGELES	NEWARK	PHILADELPHIA	SALT LAKE CITY
BALTIMORE	CHICAGO	DETROIT	LOUISVILLE	NEW ORLEANS	PITTSBURGH	SAN FRANCISCO
BOSTON	CINCINNATI	INDIANAPOLIS	MILWAUKEE	NEW YORK	PROVIDENCE	SEATTLE
	CLEVELAND	KANSAS CITY	MINNEAPOLIS	OMAHA	ST. LOUIS	

"CLEAN FLOORS Reflect Clean Business"

FINNELL SCRUBBER

It **SCRUBS** *Electrically!*

FINNELL SYSTEM

OF POWER SCRUBBING

"Dat sho' am a handy baby, Boss"

"Yas, suh, I don't need no nigger helping me when I use dat Handy Andy truck, cause, Boss. dat baby jus nachelly lifts dem heavy bales by itself, and it lifts 'em without gettin underneath 'em too. Why Boss, I can load fifteen hunnard pounds on dat truck without any help and do it quicker dan I usta could with dem old style trucks with two niggers helping me."

The HANDY ANDY ONE MAN TRUCKS are no experiments but are being used in some of the largest plants in this country. Their success is due to their simple strong features that can be found in no other truck. It is a one man truck and lever on wheels. It lifts the package without getting under it. It can be used in cramped places and with the boxes or packages against the walls. No helpers needed. One man and the Handy Andy handles the heaviest packages.

Let us tell you about the many features of this time and labor saving little truck, and the secrets of how it accomplishes its work so easily.

Handy Equipment Corporation

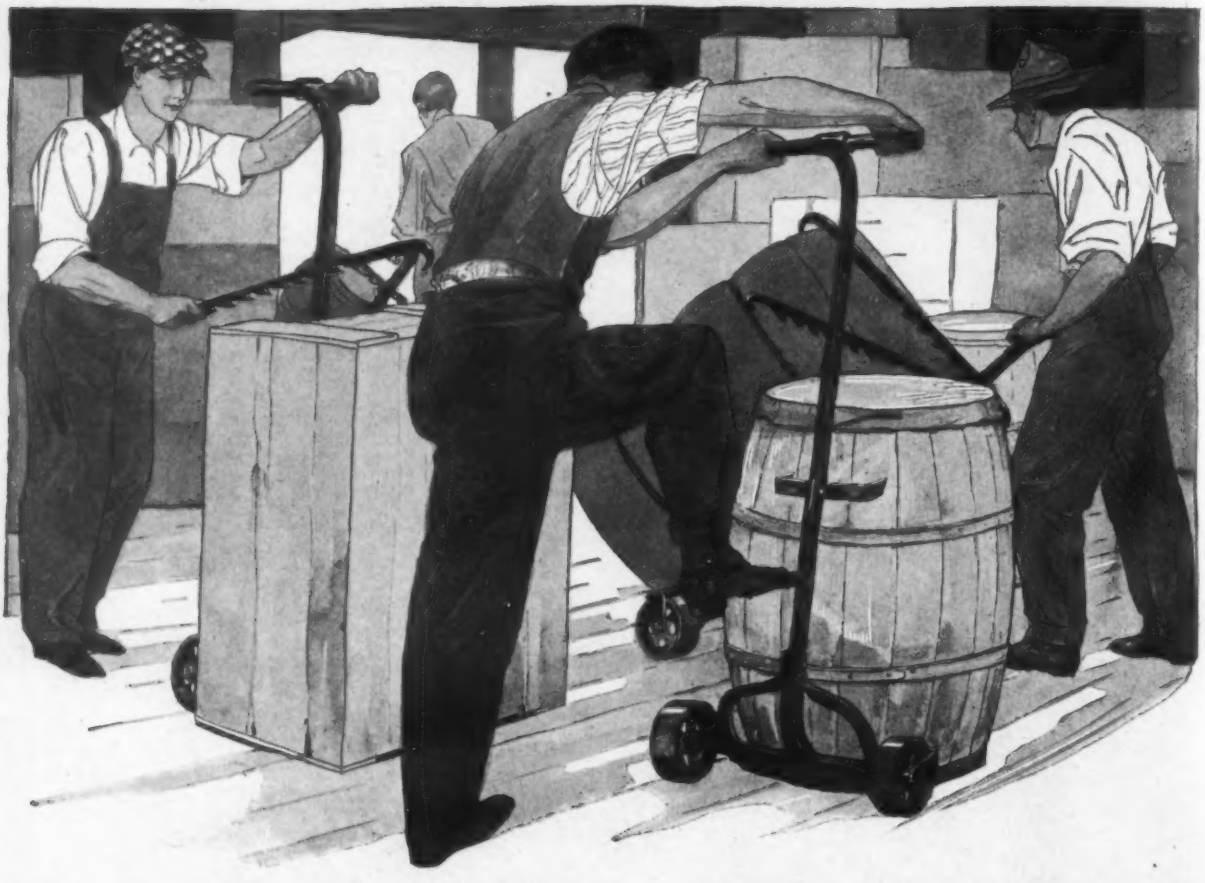
PEORIA, ILLINOIS.

J. KIRK ROWELL CO., Dist. Mgr.

716 Atlanta Trust Bldg., Atlanta, Ga.

HANDY ANDY ONE MAN TRUCK

Type B
With
Movable Axle



One-Two-Three—*They're Off!*

One pair of hands and a McKinney Truck means speed. Merchandise moves on the double quick! Each man is an individual unit. There's just as much difference between the McKinney method and others as there is between a sprint and a three-legged race.

No matter how heavy or bulky the load, whether it be box, bale or barrel, one man can handle it with ease. Extra helpers or loaders who work only 50 per cent of the time will give you a full day's work when the McKinney One-Man Service is installed.

The McKinney One-Man Truck is loader, helper and bale hook all in one. And it's easy to operate. All the truckman has to do is to throw the steel package holder over the load, pull back on the handle and the merchandise is on its way—perfectly balanced and easy to handle.

And here's another special feature. McKinney One-Man Trucks are so compact, so light and so easily operated that they can be carried right along on the motor truck and serve in the unloading as well as in the loading. In this way the length of stops is cut down and more trips a day are made possible.

McKinney One-Man Trucks are of light, rugged construction—sturdy enough to carry the heaviest box, bale or barrel you handle. They are suitable for moving any kind of merchandise under the most difficult trucking conditions.

Don't let two men work on a job which one man can do quicker and better. Install the McKinney One-Man Truck service in your shipping department. Investigate this "truck on a truck" idea. See how it will speed up deliveries and slow down motor overhead.

Our illustrated catalog, "The One-Man Method," will answer your particular trucking problem. Send us your name and address and we will forward you a copy of this interesting booklet.

McKinney Manufacturing Co.
Pittsburgh

Export Representation
The Lovingood Co., Atlanta, Ga.

Also manufacturers of McKinney Hinges and Butts, garage and farm building door-hardware and furniture hardware.

McKINNEY *one-man* TRUCKS

ELWELL-PARKER

ELECTRIC TRUCKS & TRACTORS FOR INDUSTRIAL PLANTS

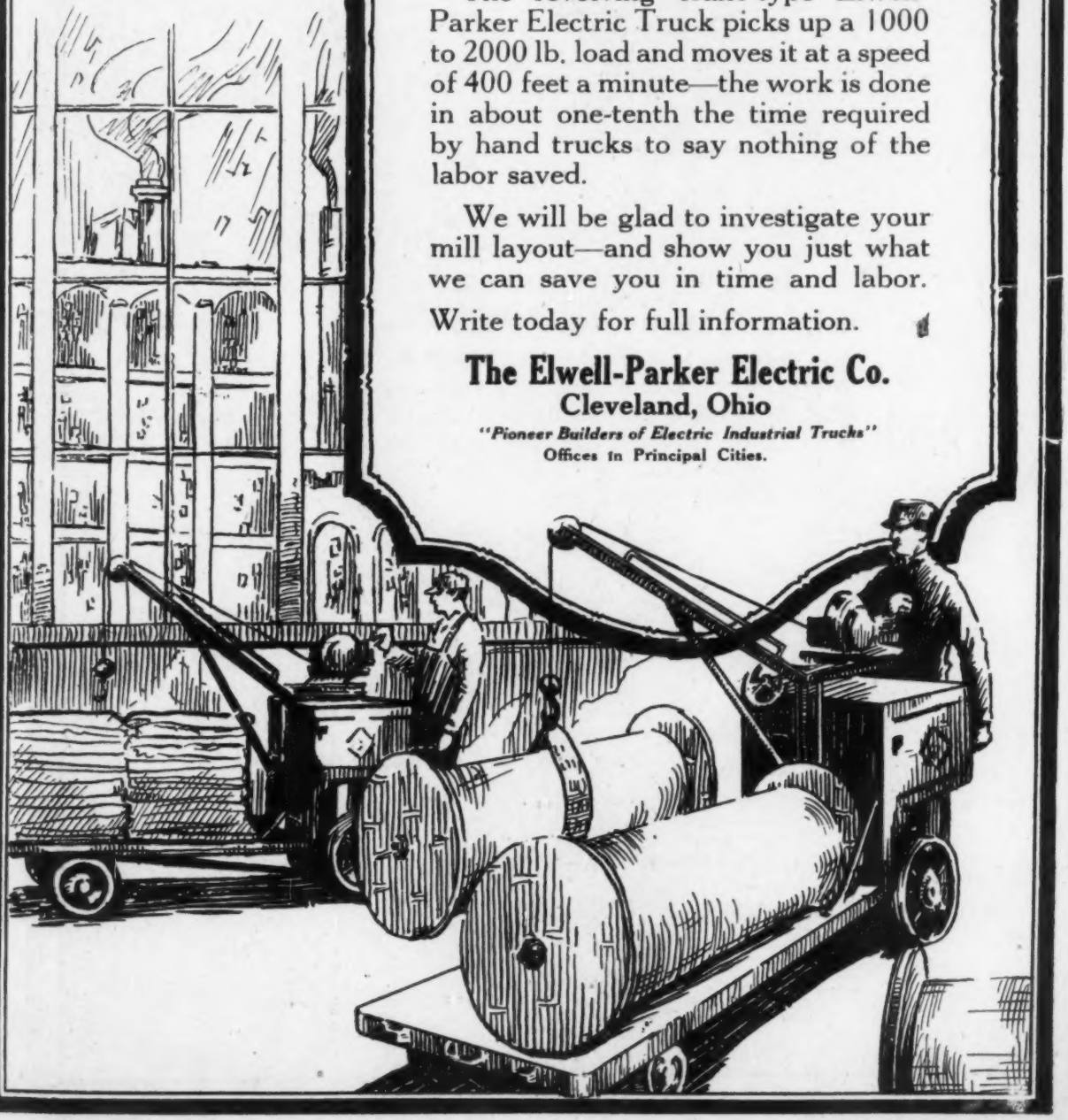
In Moving Heavy Objects

The revolving crane-type Elwell-Parker Electric Truck picks up a 1000 to 2000 lb. load and moves it at a speed of 400 feet a minute—the work is done in about one-tenth the time required by hand trucks to say nothing of the labor saved.

We will be glad to investigate your mill layout—and show you just what we can save you in time and labor.

Write today for full information.

The Elwell-Parker Electric Co.
Cleveland, Ohio
"Pioneer Builders of Electric Industrial Trucks"
Offices in Principal Cities.



OWNERS' FAITH
in
WHITE TRUCKS

THE following list of large investments in White fleets shows the faith large truck owners have in White equipment.

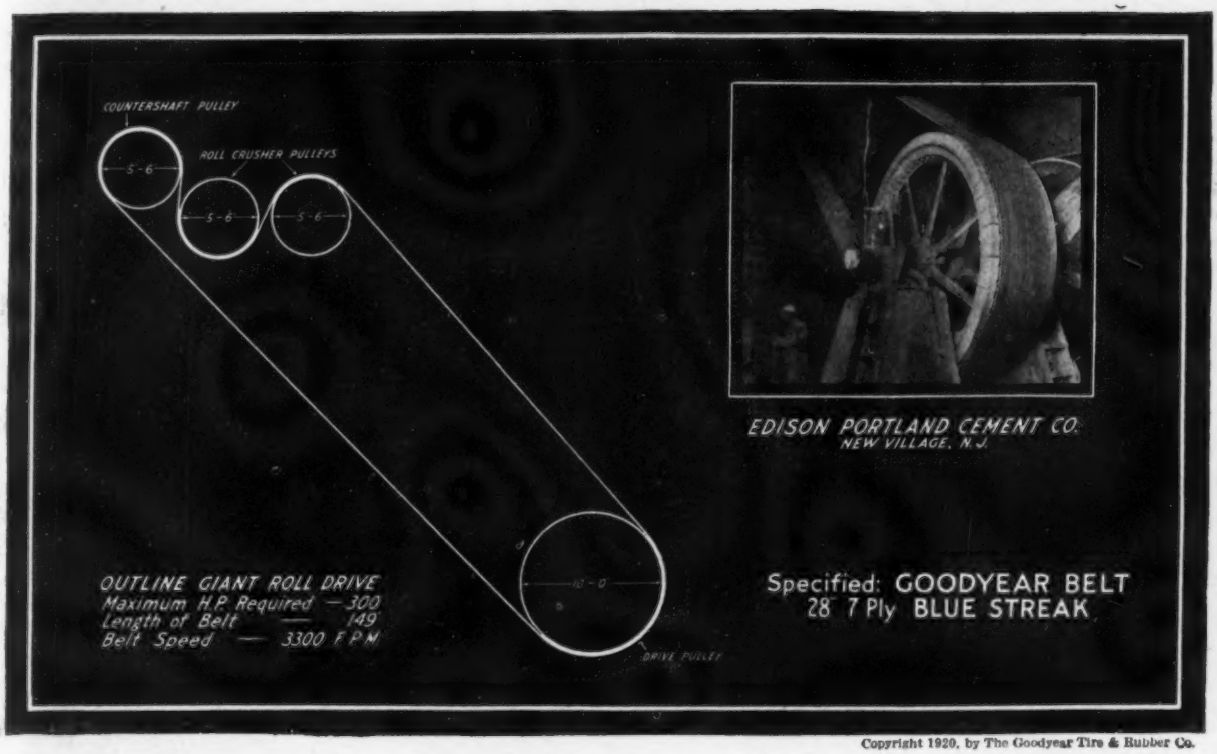
2 owners have invested over	$2,000,000		
4 owners have invested between	1,000,000	and	$2,000,000
5 owners have invested between	500,000	and	1,000,000
22 owners have invested between	250,000	and	500,000
82 owners have invested between	100,000	and	250,000

Experienced truck users *know* truck value in terms of earning power, through actual performance of one truck against another.

They *know* that White Trucks do the most work for the least money, and they back that knowledge by increasing their investments year after year.

The purchaser of one or a few trucks can safely follow their example.

THE WHITE COMPANY
CLEVELAND



Copyright 1920, by The Goodyear Tire & Rubber Co.

Six Times the Belt Life—and the G. T. M.

Three months was the average life of a belt in the hard, intermittent service of the giant roll drive on the stone crusher in the Edison Portland Cement Company's plant at New Village, N. J.

The power demanded for crunching the limestone, the constant rain of stone dust and bits of rock falling on the belt, and the crusher design that required the use of both sides of the belt, all proved too severe for even the better grades of belting which the Company was using. Some of the poorer ones lasted only two weeks.

The prospect of better service from a belt scientifically specified to that gruelling duty was held out by the G. T. M.—Goodyear Technical Man. The Company authorized him to make an expert analysis of the drive, and co-operated in his work by supplying full information on service conditions peculiar to the plant.

Among other facts, the following salient features of the giant roll drive were noted by the G. T. M. in his study: the belt drives over the pulley on the first roll, under on the second, and over the driven pulley on the countershaft; all these pulleys are 66" in diameter; the drive shaft pulley is 10' in diameter; the drive inclines at a 45° angle; speed maintained, 3300 F. P. M.; the power required is 300 horse.

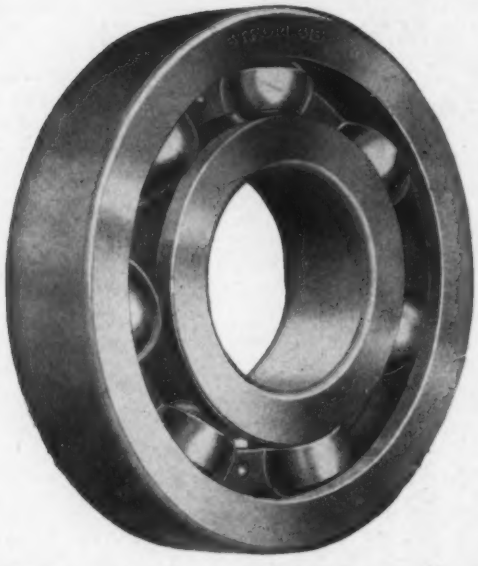
He recommended a Goodyear Blue Streak Belt, 28-inch, 7-ply—a great, strong belt, proof against slippage, liable to little stretch, and full of life. It has transmitted full power to the heavy rolls with unfailing certainty. It has ended the troubles of cutting and splicing that other belts developed by their tendency to stretch.

It lasted seventeen months before being replaced by another Goodyear Blue Streak Belt of the same quality and dimensions. Throughout its term of service it gave full measure of dependable, trouble-free, powerful transmission. It registered economy in its extra life, in freedom from repair costs, and in demonstrable value as a factor for increased production and general plant efficiency.

These profitable results of Goodyear Belt Service on the giant roll have made the Edison operating officials firm believers in the Goodyear plan of specifying a belt to its work. They have had the G. T. M. make other analyses, and ordered Goodyear transmission, elevator and conveyor belts in accord with his recommendations.

The same service, in G. T. M. knowledge and in these Goodyear Belts that we make to protect our good name, is at your command for a single drive or an entire plant. Write to The Goodyear Tire & Rubber Company, Akron, Ohio, or Los Angeles, Cal., for further information about it.

GOODYEAR



Your Slasher Wastes Yarn. Why Not Save It?

In textile mills the cut waste at the slasher is almost a total loss. Perfect run-outs are impossible;. but the worst ones can be done away with if the yarn doesn't slip on the warper measuring rolls.

Strom Ball Bearings on your measuring rolls will reduce this slippage. There is a Strom Bearing especially adapted to this application. A small number of large, perfect balls, running in highly polished grooved races give an almost frictionless bearing mounted in a housing designed just for this use. They **do** cut down the slippage.

Users say that ball bearings have saved as much as two pounds of waste on a set of seven beams. A much smaller saving would pay for the bearing in three months.

Strom Bearings for textile installations are distributed throughout the South by the Aldrich Machine Works, of Greenwood, S. C. Their experts will gladly help you with your bearing problems.

Radial bearings made in a wide range of sizes for light, medium and heavy duty.
Angular contact bearings especially designed to support combinations of radial and heavy end thrust loads.
Thrust bearings made in all types and sizes with flat and grooved races.

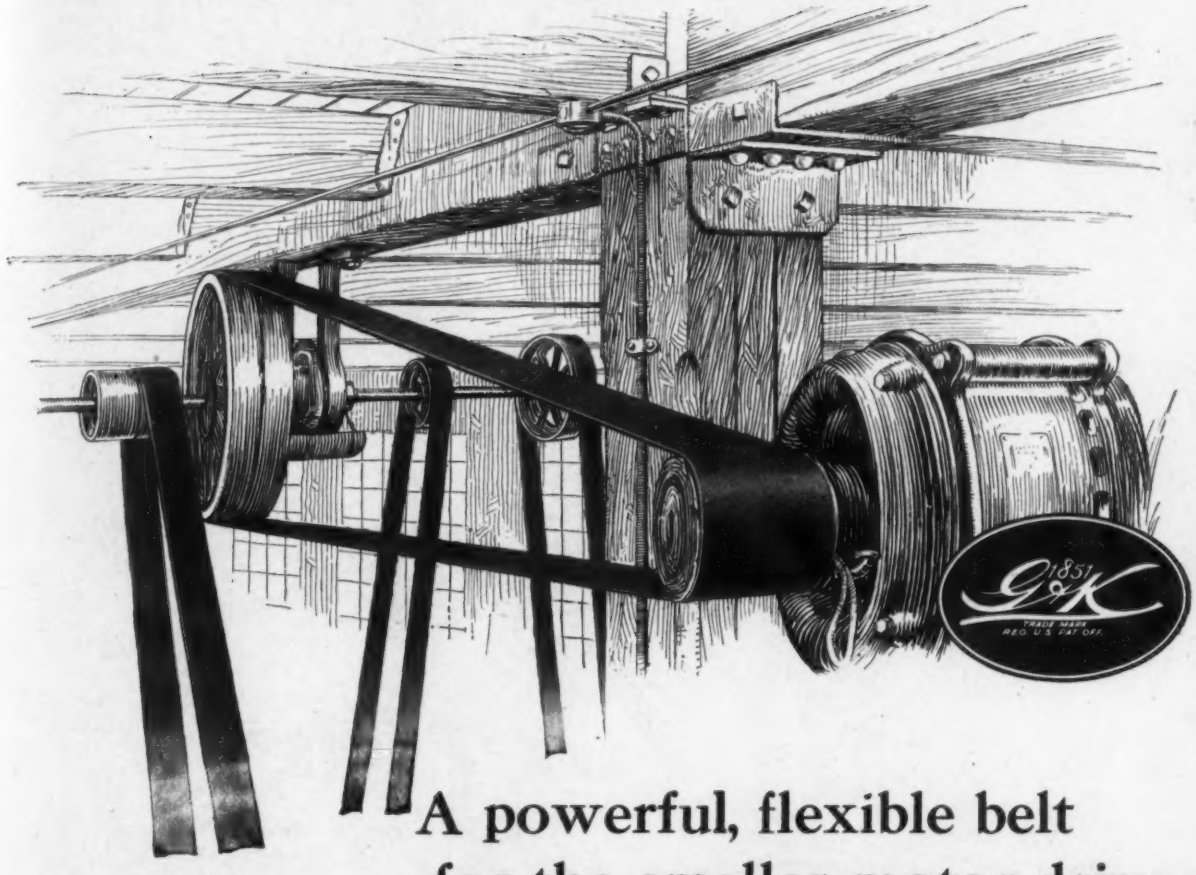
U. S. Ball Bearing Manufacturing Co.

(Conrad Patent Licensee)

4544 Palmer St., Chicago, Ill.

80

Strom BEARINGS



A powerful, flexible belt for the smaller motor drives

This trademark identifies G & K GraKnight Dynamo Double, a first-quality belt at a comparatively low cost. Designed especially for small motor drives, it runs smoothly over small pulleys under both heavy and light loads.

How is Graton & Knight Leather Belting standardized?

Each type of power requirement is analyzed and the proper type of belt designed especially for it. For motor drives up to 40 H. P.—the most universal belting drive—we have designed and standardized the GraKnight Dynamo.

GraKnight Dynamo answers in every particular the demand which motor drives make for flexibility and lightness, with ability to operate smoothly over small pulleys at high speeds.

GraKnight Dynamo is reasonably priced, just the right belt for small motor work, where light loads are the rule, heavy strains the exception.

It is a light and extremely flexible belt, built double for motor drives, giving tremendous stamina and long wear economy. It is made of strictly first-quality center stock, oak tanned leather—carefully selected for uniform thickness and pliability.

G & K engineers are constantly on the job, analyzing the power needs of various industries, devising new standards to meet new conditions, designing new belts; always keeping the Standardized Series complete and up to date for every class of power transmission.

Write for our book on the Standardization of Belting—telling us the type of power transmission you are interested in

THE GRATON & KNIGHT MFG. COMPANY, Worcester, Mass., U. S. A.

Oak Leather Tanners, Makers of Belts and other Leather Products

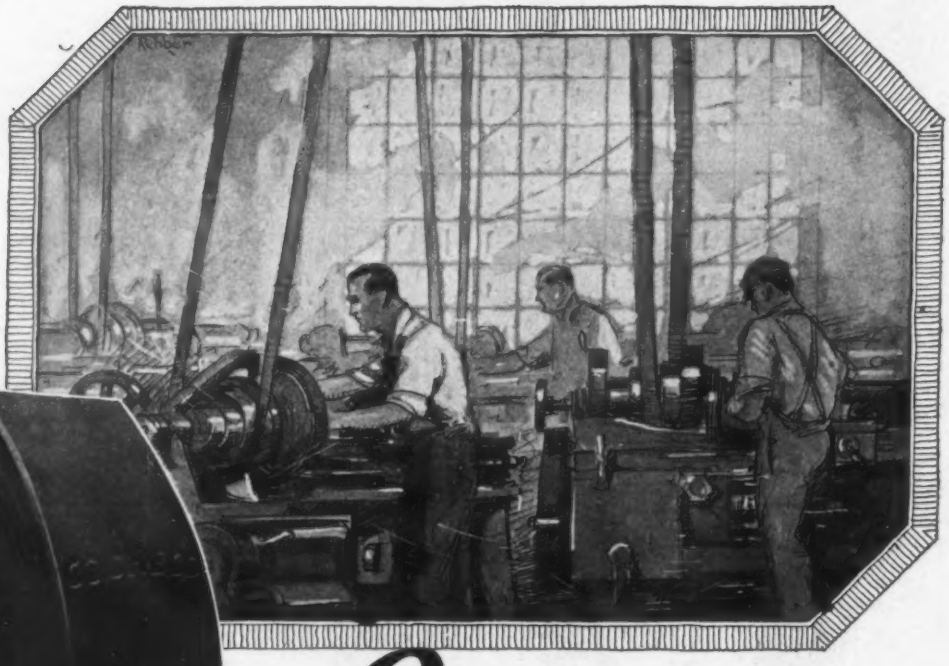
Branches and Distributors in All Principal Cities

Graton & Knight

Standardized Series

Leather Belting

Tanned by us for belting use



Better Belting

Cocheco Belting is a product of the better class manufactured for use in plants which are equipped under the policy that the best is the least expensive in the long run.

Cocheco Belts are made from the choicest center section of first grade, heavy, oak tanned butts. They are the best that 77 years of experience combined with expert workmanship can make.

They may cost more than some other brands, that are sold on a price basis, but they are worth many times the difference in the long service and perfect power transmission which they give.

Cocheco Belts are truly "Better"

I. B. Williams & Sons

Dover, New Hampshire

14-16 N. Franklin Street Chicago, Ill. | 71-73 Murray Street New York, N. Y. | 157 Summer Street Boston, Mass.

COCHECO BELTING

IN the bearings sponsored by **SKF** its type of anti-friction bearings have been developed to their highest perfection. And **SKF** further provides an engineering service not only to assure to itself proper application and use of **SKF** marked products, but to help the buyer to fully capitalize the mechanical value built into each device. This service is freely offered and is being continually broadened and advanced by laboratory research that is international in scope. You are assured a similar service behind every product bearing the mark—

SKF

Among these products now offered are:

Single row deep groove ball bearings.
Double row self aligning ball bearings.
Steel balls.
Transmission Equipment.

SKF Industries, Inc.
165 Broadway, New York City
Supervising at the request of the stockholders
The Hess-Bright Manufacturing Co.
SKF Ball Bearing Co.
Atlas Ball Co.
Hubbard Machine Co.
SKF Research Laboratories

***SKF** Research Laboratory established at Philadelphia to co-operate with the big Gothenburg Laboratories in the study of the American Manufacturers' friction problems.*

"Pioneer" STEEL HANGER

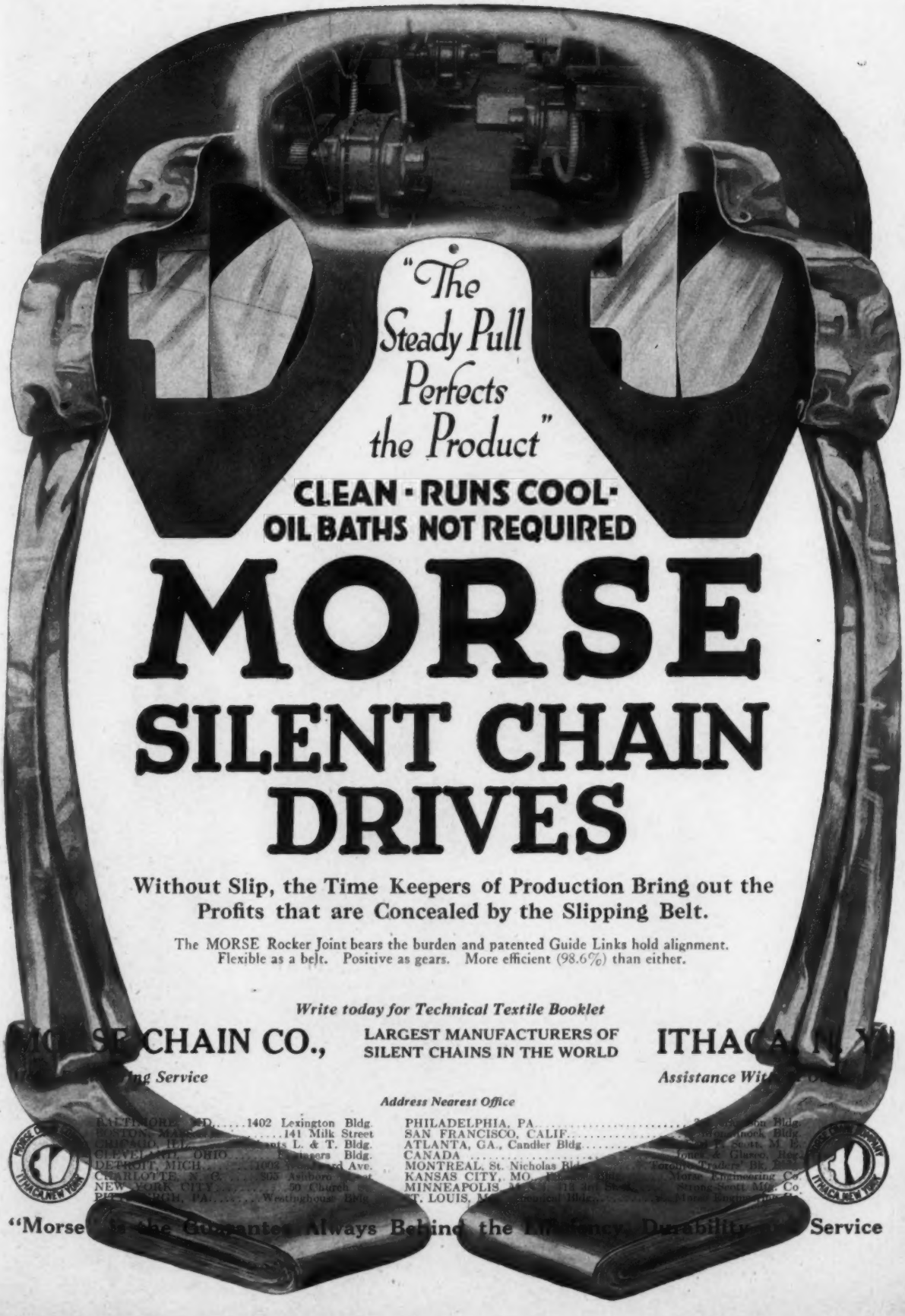
"I've handled all kinds of hangers since I started millwrighting; but these 'Pioneer' Steel Hangers are my choice. Why? The answer's easy. I can hang them all day and alone if necessary. These old-fashioned cast-iron hangers seemed to weigh a ton around three o'clock in the afternoon. It took three of us to handle them, too. It's different now; the boss uses 'Pioneer' altogether. They're safe; and I never yet heard of a 'Pioneer' coming down — and that's a mighty good point. The difference in first cost is in favor of the 'Pioneer,' so they are preferable every way you look at them."

Ask for our booklet "Transmission Data." It's worth reading.

"I'll Take the Steel Hanger Every Time"

STANDARD PRESSED STEEL CO.

PHILADELPHIA, U. S. A.


"The Steady Pull Perfects the Product"
CLEAN - RUNS COOL -
OIL BATHS NOT REQUIRED
MORSE
SILENT CHAIN
DRIVES
Without Slip, the Time Keepers of Production Bring out the Profits that are Concealed by the Slipping Belt.
The MORSE Rocker Joint bears the burden and patented Guide Links hold alignment.
Flexible as a belt. Positive as gears. More efficient (98.6%) than either.
Write today for Technical Textile Booklet
CHAIN CO.,
LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD
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ng Service
Assistance Wit
Address Nearest Office
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CLEVELAND, OHIO Engineers Bldg.
DETROIT, MICH. 1002 Ford Ave.
CHARLOTTE, N. C. 805 Ashboro
NEW YORK CITY 50 Church
PITTSBURGH, PA. Westinghouse Bldg.
PHILADELPHIA, PA.
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ATLANTA, GA., Candler Bldg.
CANADA
MONTREAL, St. Nicholas Bldg.
KANSAS CITY, MO.
MINNEAPOLIS, MINN.
ST. LOUIS, MO.
"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service

Ladew

Since 1835

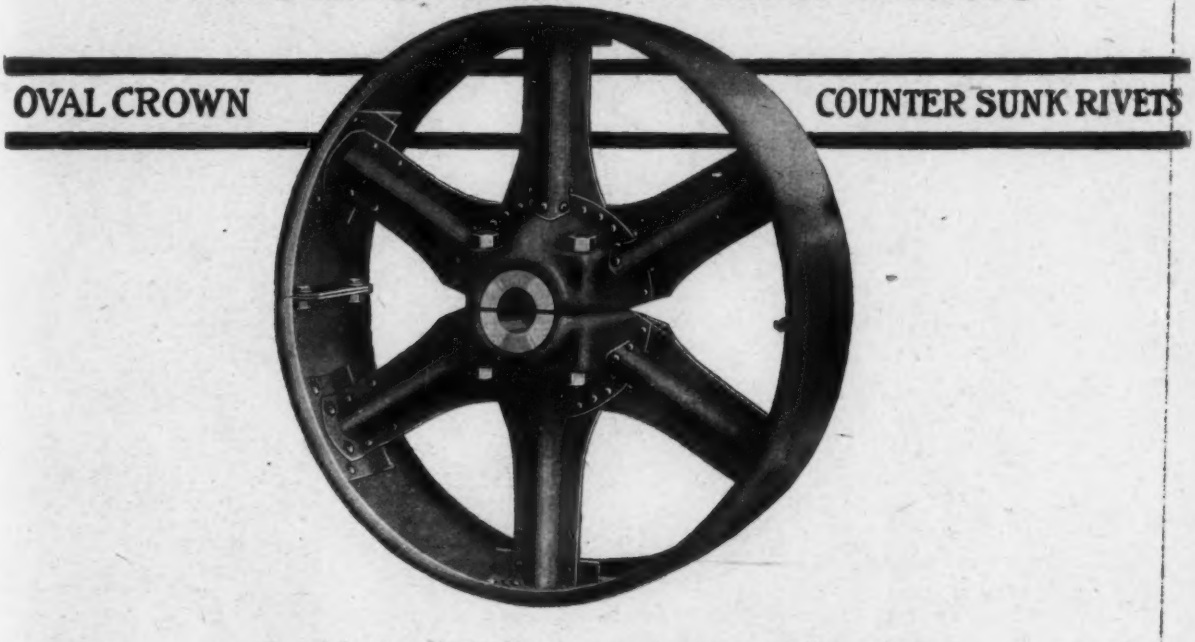
No economic law is more f i r m l y established than this: Wher dealing with responsible manufacturers, the more you are asked to pay, the more the value offered you. Buying belting, you'll get just as much power transmission economy as you're willing to pay for. The price asked ought to be the least influential factor, except as you are able to weigh it with the service-rendering capacity it covers. Since 1835 belting prices have varied within wide limits. But in all those 85 years every Hoyt Leather Belt has been worth its price. And those who paid that price secured a degree of service which made their Hoyt Belts extremely inexpensive.

EDW. R. LADEW CO., INC.
NEW YORK, N.Y., U.S.A.
Since 1835
...anches and Distributers, with Complete Stocks, in All Principal Cities

Oneida Steel Split Pulley

TRANSMITS POWER AT LOWEST COST

Arms and Hubs Are Interwoven



Oneida Steel Pulleys may be run with perfect safety at any speed at which it is practicable to operate a belt. The fish-plate arm to rim connection makes it a "safety first" pulley in every sense.

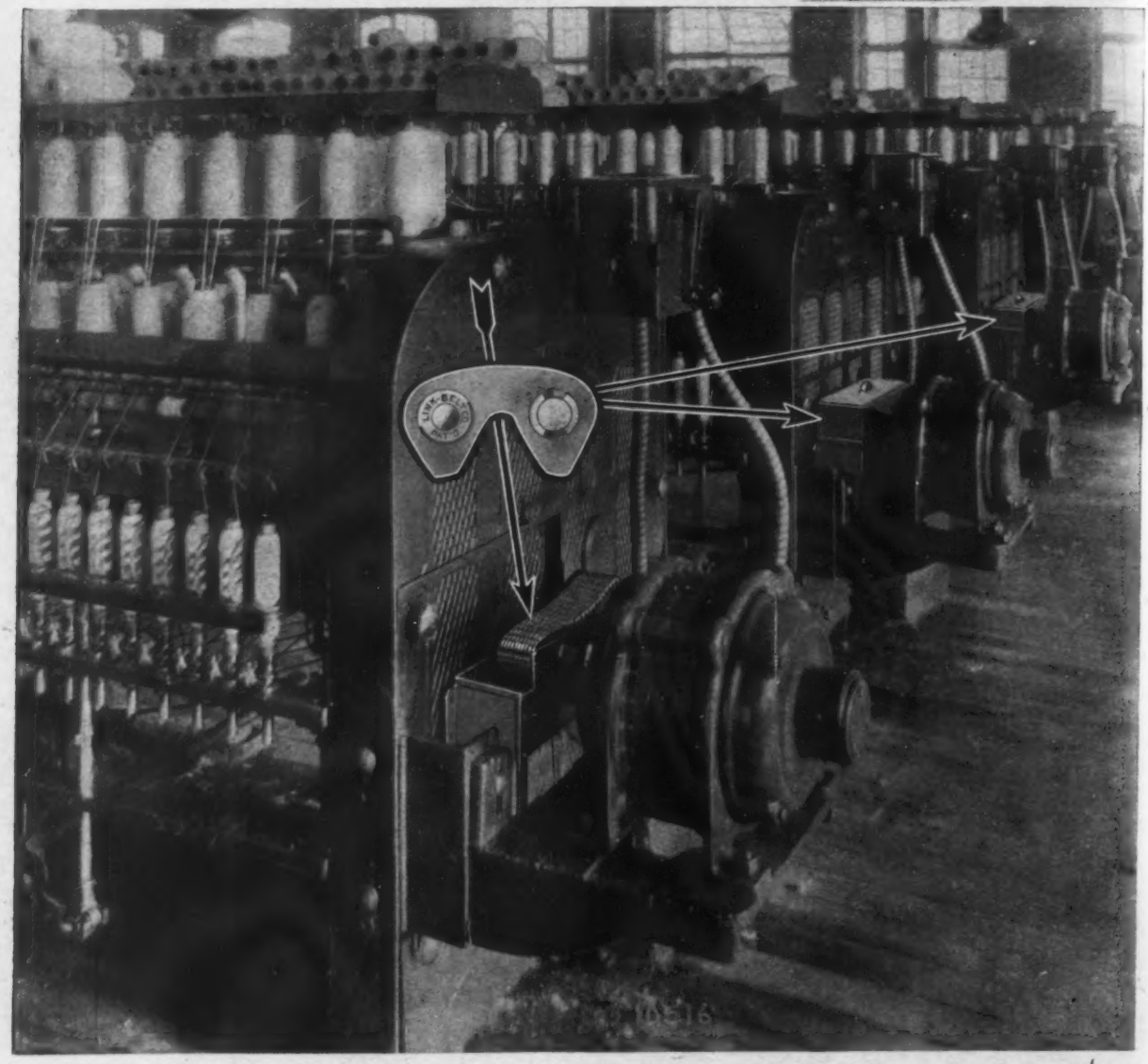
The arms, as well as the hubs, of the Oneida are made in two pieces. They are interwoven into the flanges of the hub and securely riveted into place. The perfect oval crown insures the greatest possible belt grip or adhesion. Transmits maximum power at minimum expense of belt pull or tension. Loose belts mean less bearing friction and saving of belts. Order Oneida pulleys from your dealer.

DODGE

Dodge Sales & Engineering Company, distributor of the products of the Dodge Manufacturing Company and the Dodge Steel Pulley Corporation. General Offices: Mishawaka, Ind. Works: Mishawaka, Ind., and Oneida, N. Y.
Canadian Plant: Dodge Mfg. Co. of Canada Ltd., Toronto and Montreal

Philadelphia Cincinnati New York Chicago St. Louis Boston Atlanta Pittsburgh Minneapolis Dallas Providence Seattle Newark

The Ideal Drive for Textile Machinery



HERE is the way modern textile mills are driving spinning frames and other machines.

Note the highly-efficient Link-Belt Silent Chain Drives enclosed in the oil-tight, dust-proof casings. See how nicely this compact arrangement adapts itself to conditions. Link-Belt Silent Chain is "Flexible as a Belt—Positive as a Gear—More Efficient Than Either".

Let us install one drive in your mill—and then watch for results. Write for Catalog No. 425.

542

PHILADELPHIA	CHICAGO	LINK-BELT COMPANY	INDIANAPOLIS	TORONTO
New York, 299 Broadway	Cleveland, 429 Rockefeller Bldg	Los Angeles, 168 N. Los Angeles St.		
Boston 9, 49 Federal St.	Detroit, 730 Woodward Ave.	Toronto, Can., Canadian Link-Belt Co., Ltd.		
Pittsburgh, 1501 Park Bldg.	Minneapolis, 413 S. Third St.	Denver, Lindroth, Shubart & Co., Boston Bldg.		
St. Louis, Central Nat'l Bank Bldg.	Kansas City, Mo., 306 Elmhurst Bldg.	Louisville, Ky., Frederick Webb, Starks Bldg.		
Buffalo, 547 Ellicott Square	Seattle, 576 First Ave., S.	New Orleans, C. O. Hinz, Hibernia Bank Bldg.		
Wilkes-Barre, 2d Nat'l Bank Bldg.	Portland, Ore., First and Stark Sts.	Birmingham, Ala., S. L. Morrow, 720 Brown Marx Bldg.		
Huntington, W. Va., Robson-Pritchard Bldg.	San Francisco, 658 Market St.	Charlotte, N. C., J. S. Cothran, Com'l Bank Bldg.		

LINK-BELT
SILENT CHAIN DRIVES

TEXTILE MEN!

It's Time to Quit Guesswork About Lubrication

With raw materials, labor and fuel sky-high, it's up to you to know that your lubrication is the best possible throughout your mill.

And you know your lubrication is of the best only when you use.

TRADE MARK REGISTERED IN
NON-FLUID OIL
UNITED STATES PATENT OFFICE

Special Textile Lubricants

NON-FLUID OIL saves in materials spoiled through oil stains. It won't drip or spatter like oil.

NON-FLUID OIL saves in labor—less frequent oiling is needed—it clings to the bearings and lasts longer.

NON-FLUID OIL saves in fuel—it cuts down friction to a minimum—its lubricating quality is so high.

A few selected grades used throughout your mill will give you better lubrication at less cost per month. Most mills are using NON-FLUID OIL at present for greater efficiency. Just write today for testing samples and our Bulletin on the Lubrication of Textile Machinery—free, of course.

Ample stocks always at our branches:

Charlotte, N. C. **Atlanta, Ga.**

New Orleans, La.

New York & New Jersey Lubricant Co.

401 Broadway **New York**

Smashing *old* precedents to secure new *economies*

The immediate success of Texaco Comb Box Lubricant shows what can be accomplished by engineers who are not content to follow the beaten track.

BRIEFLY STATED, HERE IS ITS HISTORY

For years it has been customary to use a high viscosity or "heavy" lubricant in the comb box. We felt that the use of products of this class entailed a wastage of power and produced a high friction temperature (often very dangerous in a textile mill). We set about to remedy this defect and after extensive investigation, experiment and operating tests, we developed and perfected

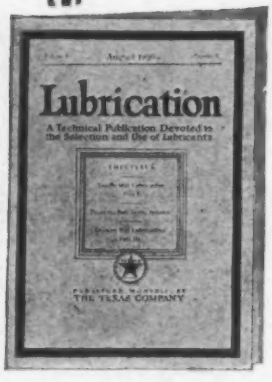
TEXACO
Comb Box Lubricant

The viscosity of this lubricant is considerably lower than most of those offered for sale or now in use. To prove conclusively that Texaco Comb Box Lubricant is adequate for the work we have only to cite two points:

First: **One filling of Texaco Comb Box Lubricants lasts two or three times as long as the other kinds.**

Second: **In every case we have shown that with Texaco Comb Box Lubricant there is a considerable reduction in frictional temperature of the box. Sometimes this difference exceeds 15 degrees.**

Texaco Comb Box Lubricant is made especially for the purpose and meets operating conditions perfectly. It brings with it the freedom from mechanical difficulties in the comb box and because of its long life, it is exceptionally economical.



Send for the August and September Numbers.

The leading articles of these two issues of our magazine "Lubrication" are on "Textile Mill Lubrication."

They take you, step by step, through every process of manufacture, indicating the right lubricant for every machine, from bale breaker to printing machine.

No theory here—plain, everyday, operating experience, translated into concise recommendations.

One feature that you will like is that we have not overburdened this discussion with any propaganda for Texaco Lubricants. We tell you what KIND of oil to use and then allow you to decide for yourself, how well we can supply each and all of your lubricating requirements with Texaco Lubricants.

Another Texaco Product worthy of special mention is

TEXACO TOP ROLL LUBRICANT

This Coupon brings "Lubrication" to you free

THE TEXAS COMPANY

Dept. O, 17 Battery Place, New York City

NEW YORK HOUSTON CHICAGO

Offices in Principal Cities

Kindly send me, free, the issues of "Lubrication" containing the articles on Textile Mill Lubrication.

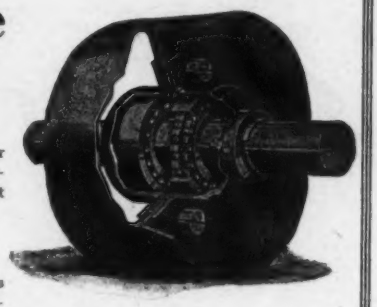
Name _____ *Street* _____

City _____ *State* _____

10-20

The Chicago Line
Ball Bearing Specialties
IN 1906

The economic value and durability of Ball Bearings for line shaft purposes was an uncertain factor, yet by laboratory test they were proven superior to babbitt or roller.



NOW—1920

After fourteen years of actual operation Ball Bearings are recognized as the most efficient trouble free, modern method of transmitting power.

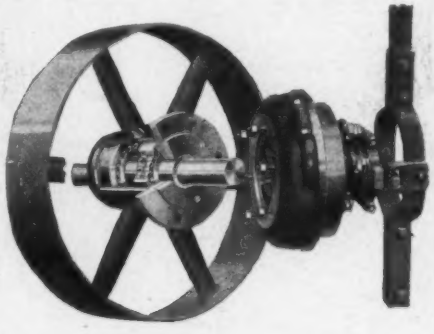
That is the reason why 4000 shops—factories and plants in Chicago alone have adopted and are installing the Ball Bearing Specialties of The Chicago Line.

Ball Bearing Specialties of
The Chicago Line
are
Daggett Ball Bearing Loose Pulley
and Ball Bearing Clutch Pulley
Ball Bearing Hangers
"All-Loose" Drives

All SKF Ball Bearing Equipped

The Chicago Line Ball Bearing Specialties are fundamentally correct in design, made of the best materials, accurately machined and equipped with the well known S K F Ball Bearings, they are trouble free, dust proof, noiseless, cannot stick, freeze or wear the shaft and require lubricant but seldom.

Write for further details.



Chicago Pulley & Shafting Company

Main Office 40 S. Clinton St. CHICAGO

Factory Menominee Falls WISCONSIN

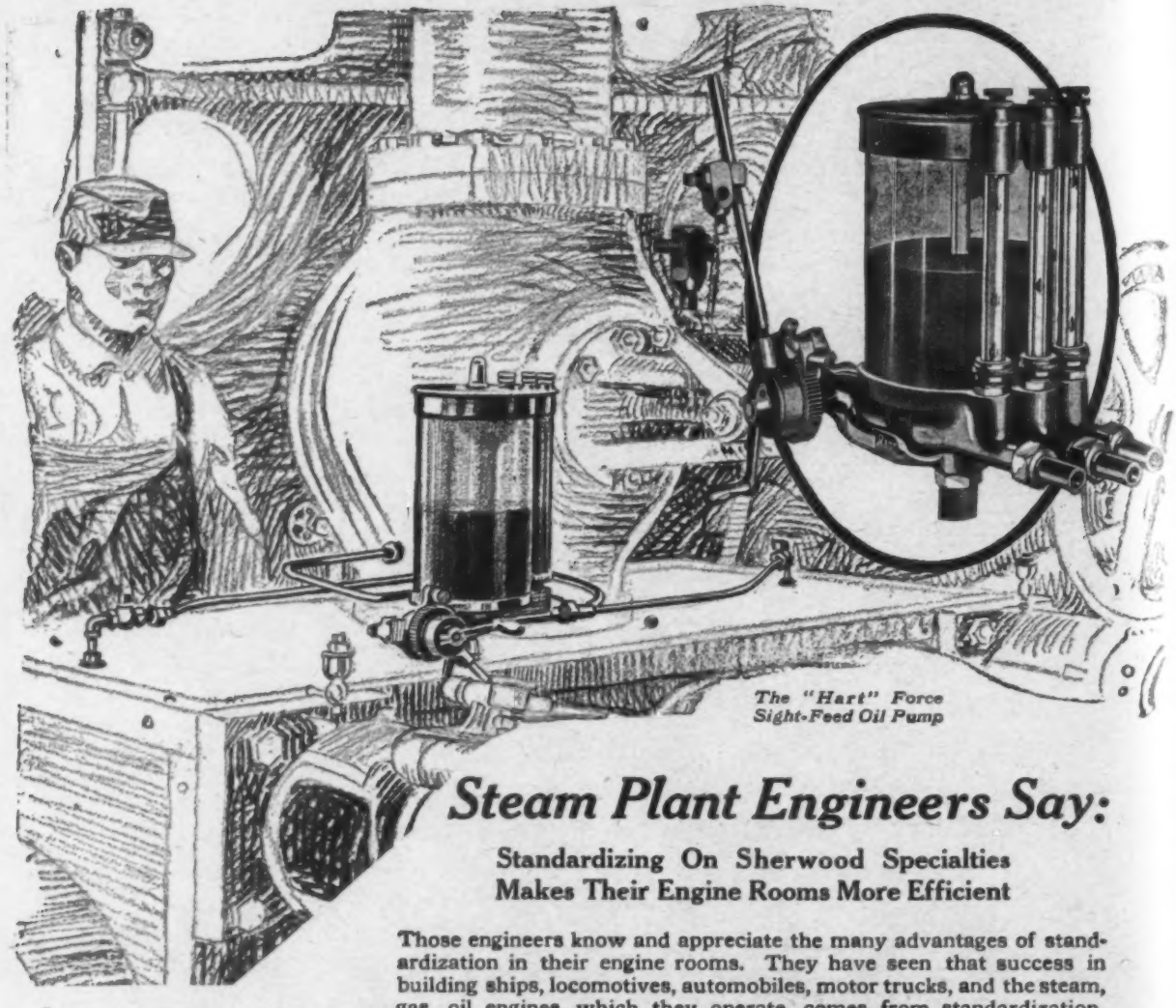
UNIFORMITY, Flexibility and Strength are the inseparable features of STANLEY SOLID WOVEN COTTON BELTING.

Uniformity means steady drive; flexibility, less slippage and more power transmitted with less tension. Stanley has more strength because it is solid woven, and has no plies or laps to come apart.

Stanley Belting withstands heat, oil and acids better than leather and rubber. That is why it is preferred in woolen and knitting mills, and in dye houses, bleacheries and finishing plants.

A sample will interest you.

STANLEY BELTING CORPORATION
36 South Clinton Street **CHICAGO, ILL.**



The "Hart" Force Sight-Feed Oil Pump

Steam Plant Engineers Say:

Standardizing On Sherwood Specialties Makes Their Engine Rooms More Efficient

Those engineers know and appreciate the many advantages of standardization in their engine rooms. They have seen that success in building ships, locomotives, automobiles, motor trucks, and the steam, gas, oil engines, which they operate, comes from standardization.

Moreover, those engineers standardize on the entire list of "Sherwood" Steam Specialties. They know that "Sherwood" Steam Specialties with the advantages of twenty-five years of successful manufacturing experience back of them—must possess merit.

Hence, those engineers are ardent users and boosters of the "Hart" Force Sight-Feed Oil Pump, "Eagle" Ejector, "Buffalo" Automatic Injector, "Buffalo" Glass Body Cylinder Oil Pump "Favorite" Flue Scraper and Flue Blower—all members of the dependable and meritorious "Sherwood" Steam Specialty Family.

Also, as engineers who are alert and keenly watching for devices which increase the results of their engine rooms, those men have discovered, just as you will, that standardization means not only a big saving of time and of money, but also speeds up repairs and makes for success in any engine room.

Now, if "Sherwood" Steam Specialties have been successfully used by those engineers for more than twenty-five years, surely you are going to standardize on them and make your engine room a success.

Have you received a copy of the Sherwood Book? It is well worth reading.

—Write your name and address on the margin of this page, forward it on to us, and we will send the Sherwood Book to you by return mail.

SHERWOOD MANUFACTURING COMPANY

Brass Founders and Finishers

Buffalo, N. Y.

SHERWOOD

ENGINEERING-SPECIALTIES

Piping for Economy and Efficiency in Steam Plants

is largely facilitated by the use of

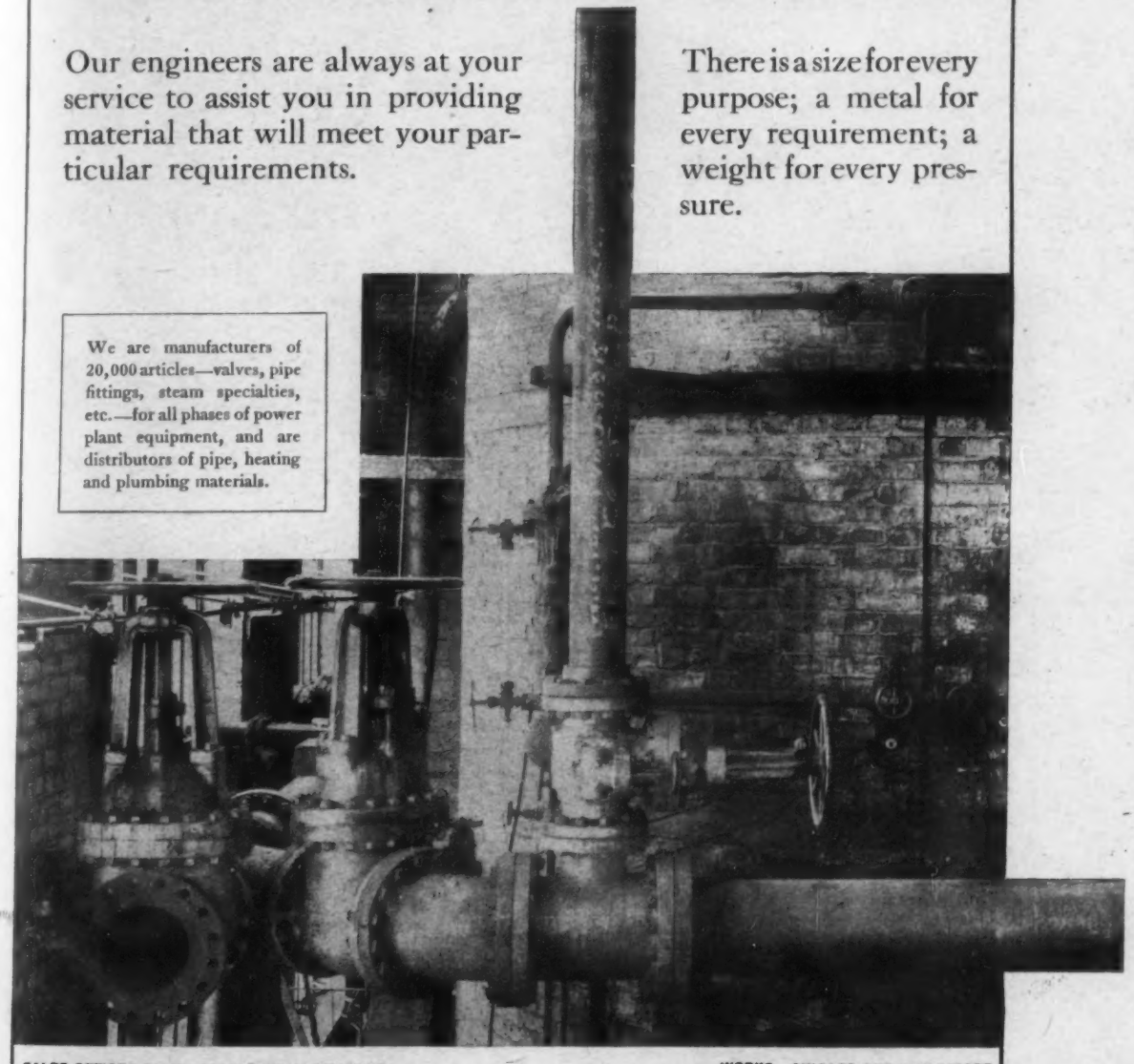
CRANE

VALVES, FITTINGS STEAM SPECIALTIES

Our engineers are always at your service to assist you in providing material that will meet your particular requirements.

There is a size for every purpose; a metal for every requirement; a weight for every pressure.

We are manufacturers of 20,000 articles—valves, pipe fittings, steam specialties, etc.—for all phases of power plant equipment, and are distributors of pipe, heating and plumbing materials.



SALES OFFICES, WAREHOUSES AND SHOWROOMS:

BOSTON, SPRINGFIELD, BRIDGEPORT, ROCHESTER, NEW YORK, ALBANY, BROOKLYN, PHILADELPHIA, NEWARK, CAMDEN, BALTIMORE, WASHINGTON, SYRACUSE, BUFFALO, SAVANNAH, ATLANTA, KNOXVILLE, BIRMINGHAM, MEMPHIS, LITTLE ROCK, MUSKOGEE, TULSA, OKLAHOMA CITY, WICHITA, ST. LOUIS, KANSAS CITY, TERRE HAUTE, CINCINNATI, INDIANAPOLIS, DETROIT

FOUNDED BY R. T. CRANE, 1855

CRANE CO.

836 S. MICHIGAN AVE.

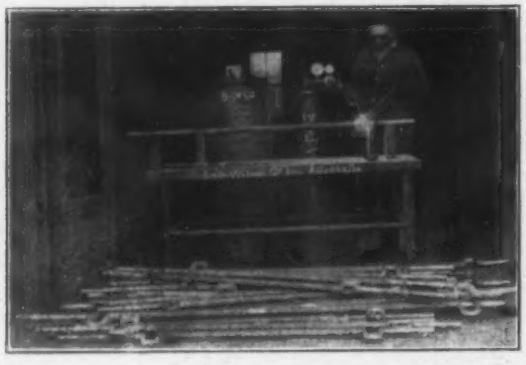
CHICAGO

WORKS: CHICAGO AND BRIDGEPORT

CHICAGO, ROCKFORD, OSHKOSH, GRAND RAPIDS, DAVENPORT, DES MOINES, OMAHA, SIOUX CITY, ST. PAUL, MINNEAPOLIS, DULUTH, FARGO, WATERTOWN, ABERDEEN, GREAT FALLS, BILLINGS, SPOKANE, SEATTLE, TACOMA, PORTLAND, POCATELLO, SALT LAKE CITY, OGDEN, SACRAMENTO, OAKLAND, SAN FRANCISCO, LOS ANGELES

CRANE LIMITED — MONTREAL, TORONTO, VANCOUVER, WINNIPEG, LONDON, ENG., SYDNEY, N. S. W., QUEBEC, HALIFAX, OTTAWA, CALGARY.

Welding Apparatus that Over 350 Mills Recognize as a Big Paying Investment



TEXTILE mills have long recognized the value of oxyacetylene welding right in their own shop, and the savings it effects not only time in awaiting delivery of broken machine parts, but the cost of the machine parts themselves. Thousands of dollars have been saved by mills using this processs, and many more dollars will be saved daily as more and more mills are installing welding apparatus.

STANDARD Welding Apparatus has for many years been used in textile mills over the South and today over 350 mills are using it with entire satisfaction. These years of experience with STANDARD Apparatus have proven to these mills that they made no mistake in purchasing it and we have many letters in our files testifying to STANDARD superiority and dependability.

STANDARD Apparatus is not expensive to operate, not complicated, and can be immediately put into operation by any mechanic when a rush job of repairing is required. It is placed in your mill subject to satisfactory demonstration and we teach your men how to operate it.

And STANDARD Service is another feature which has proved valuable to these mills. A STANDARD service station is located near you, and if you have a job too big for your men to handle, our men will be rushed to your plant to help you.

Our representatives will be glad to call and explain in full and make a demonstration of STANDARD Apparatus in your own shop. No obligation. Write for catalog.

STANDARD GAS PRODUCTS CO., INC.

STANDARD

Our New Oxygen Manufacturing Plant Located At Atlanta

99.5 PURE OXYGEN

HERETOFORE, one of the biggest items of expense in using oxy-acetylene welding was the cost of delivery of oxygen. We have cut down this expense to the minimum by installing oxygen supply stations at convenient points over the South. These stations can ship oxygen to you on short notice and being located near you the freight cost is negligible.

We have just completed a new oxygen plant at Atlanta which is now manufacturing the purest oxygen. Regardless of the quantity of oxygen gas your welding jobs consume, if this gas isn't as pure as STANDARD, you are losing money. When you use STANDARD OXYGEN you are reducing your welding costs to the minimum, for STANDARD Oxygen is 99½% pure—the best that can be bought.

STANDARD is the first company in the South to manufacture oxygen, and satisfaction is insured by prompt shipments, full measure and absolute purity of oxygen. This satisfaction is attested to by the fact that our business has increased over 800% in the last two years.

There's a Service Station located near you. Write the one nearest you.

ATLANTA, SAVANNAH, CHATTANOOGA, GRETNA, LA.

WELDING APPARATUS AND SUPPLIES

WATERHOUSE

Oxy-Acetylene Cutting and Welding Outfits

All Waterhouse products are built on the idea that the very best workmanship and material make a product which in the end is the cheapest.

All Waterhouse products are built on the idea that the very best workmanship and material make a product which in the end is the cheapest.

NO TEXTILE MILL can afford to be without a WATERHOUSE Welding Equipment. It often pays for itself on a single job. Having a WATERHOUSE Welder is like having a complete stock of new parts, for any broken part may be made as good as new in a short time. No delay while new parts are coming from the factory; no money tied up in spare parts. It is making and saving in many mills; put it to making and saving for you.

WATERHOUSE WELDING COMPANY

BOSTON, 18, MASS.

Complete catalogue on request.

THE SIMPLEST STOKER IN THE WORLD

COKAL

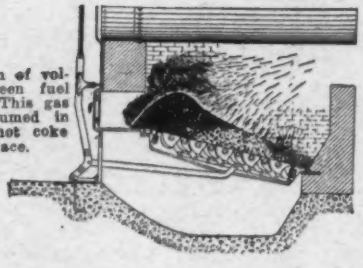
HAND OPERATED

STOKERS

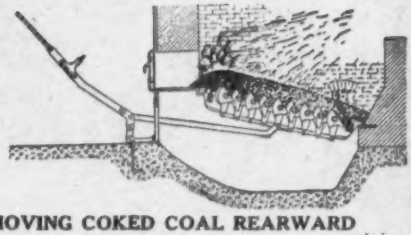
ARE SELF-CLEANING

Immediately After Firing

Note the distillation of volatile gas from green fuel at furnace front. This gas is completely consumed in passing over the hot coke at the rear of furnace.



Automatically Leveling the Fuel Bed Before Adding More Coal No Multiplicity of Levers



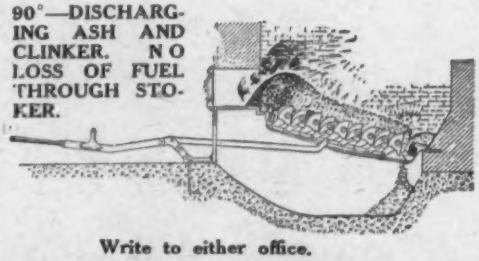
45°—MOVING COKED COAL REARWARD

COTTON MILL SAVES 10 PER CENT

The Irene Mills, Gaffney, S. C., say:

Since using the COKAL stokers our fuel consumption will average a saving of approximately 10 to 15 per cent. With the present high price of fuel, this saving amounts to considerable. The Cokal Stoker is a quick steamer and labor saver. We are highly pleased with them as being all that you claim for them.

90°—DISCHARGING ASH AND CLINKER. NO LOSS OF FUEL THROUGH STOKER.



Write to either office.

COKAL STOKER CORPORATION

1017 No. CLARK ST., CHICAGO.
517 HURT BLDG., ATLANTA.

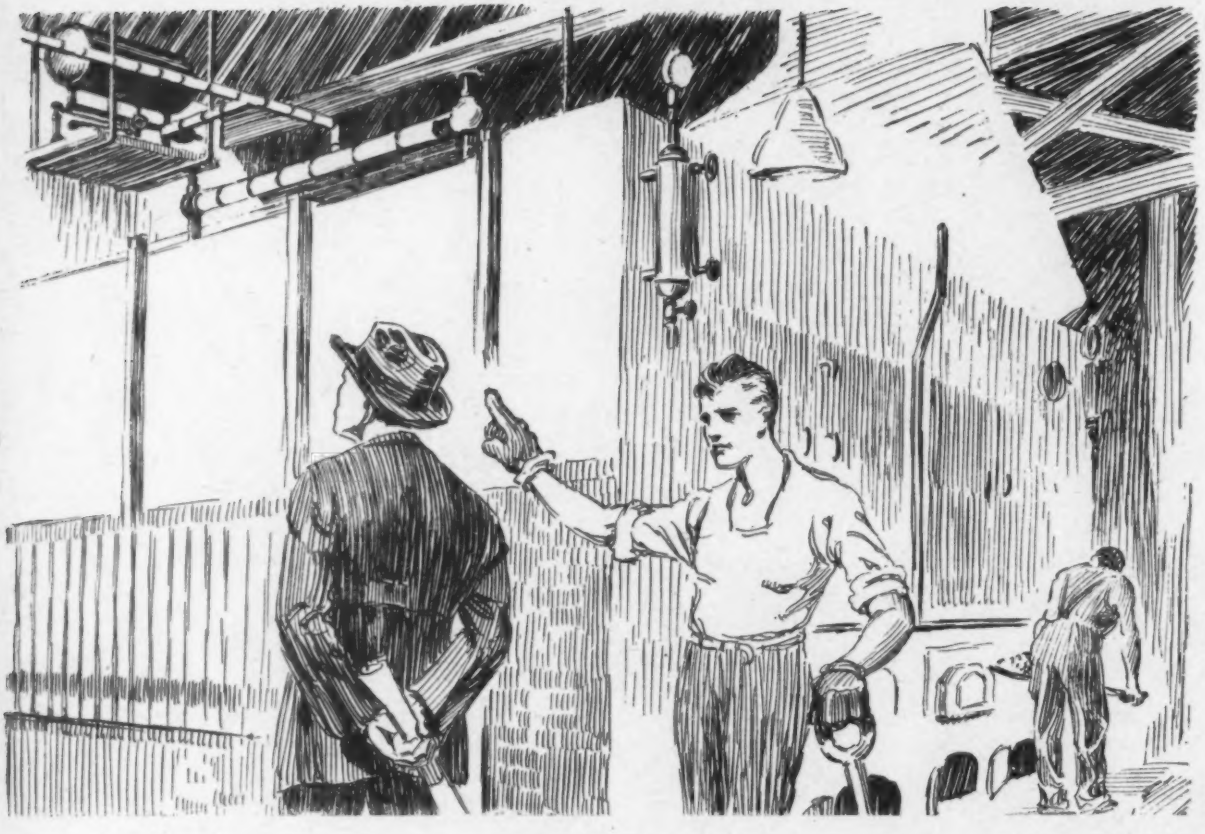
SAVING MORE THAN GUARANTEED

The Elizabeth Mills Co., of Charlotte, N. C., say:

COKAL stokers are doing more than you claimed for them in the saving of fuel and labor. They are absolutely fool-proof, and do not require an experienced man to operate them. We consider them the best on the market and recommend them to any prospective buyer, in fact every mill ought to use them.

WE GUARANTEE 10 PER CENT FUEL SAVING

Send us type and horsepower of present boilers and size of grates. We will send full information and show you a working model.



"It Saves 20 Per Cent of Coal"

Why use five tons or five cars of coal when with the Morehead Back-to-Boiler System draining your steam lines and steam-heated equipment you can get the same results with four.

It's because the Morehead System returns the water of condensation direct to boilers at high temperature—temperatures that prevent the operation of a steam pump—that hundreds of manufacturing plants are buying one-fifth less coal this year and have effected a 20 per cent fuel saving year after year.

We will gladly refer you to Morehead users in your locality. Write for catalog.

Morehead Manufacturing Co.

DETROIT, MICHIGAN

Canadian Morehead Manufacturing Co., Woodstock, Ont.
For Dominion of Canada.

The "Morehead" Return Trap.

Positively Drains All Types of Steam Apparatus

Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature

Your Fuel Bills are Less

Morehead

"BACK-TO-BOILER-SYSTEM"

ABERTHAW
CONSTRUCTION COMPANY
ATLANTA PETERS BUILDING

For the Holston Manufacturing Company at Knoxville, Tennessee, ABERTHAW *is erecting a mill with reinforced concrete exterior walls and interior columns, but with wooden beams and floors.*

This composite type of structure, which offers economies even as against brick and timber, is worth investigating.

ORGANIZATION—
HUMAN OR MECHANICAL

ORGANIZATION is a peculiar thing. The mechanical relationships of men who are associated in a given work may be clearly and tidily shown by diagram.

¶ Yet no diagram can show the character of these men, their native skill, their experience individually, or as a collective unit.

¶ These, however, are the considerations by virtue of which the charted mechanism remains merely a mechanism or asserts itself as a living force.

¶ *ABERTHAW* is proud of the exactitude with which each part of its organization articulates with each other part. It is far prouder of the individual quality of its men and of the spirit of honest endeavor which binds them into a compact working force intent upon achieving success for the Company through unsurpassed service to the Client.

¶ *Built by ABERTHAW* is the mark of a guild whose common purpose is the achievement of economy, quality, adequacy.

ABERTHAW
CONSTRUCTION COMPANY
BOSTON ATLANTA BUFFALO
PHILADELPHIA

6-104

The Attractive Mill Village

is an important factor in securing labor.

THE tendency of the times is toward beauty—and it is universal. Formerly it was characteristic of the wealthy. Now it has found its way into the homes of all classes. The attractiveness of the home, its surroundings and the village as a whole, will play an important part in your labor problems of the future.

The interest of the mill demands *lasting qualities* in the construction of homes for its operatives.

Human nature demands *convenience* of arrangement.

Comfort is the inherent right of every human being.

Strictest *economy* at a time of high costs is highly essential in all construction.

All These—Beauty, Durability, Convenience, Comfort, Economy

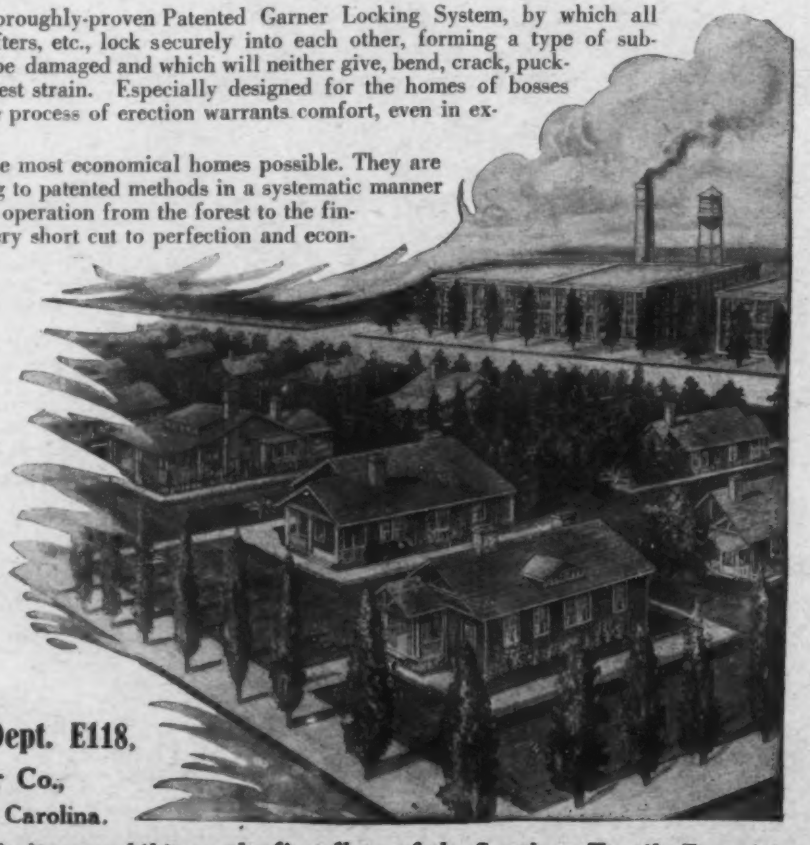
are the principal features of

QUICKBILT BUNGALOWS

Snug, attractive, well-planned, artistic, roomy little bungalows especially designed for attractive, industrial villages.

Built after the practical, thoroughly-proven Patented Garner Locking System, by which all sleepers, joists, panels, plates, rafters, etc., lock securely into each other, forming a type of substantial home that cannot easly be damaged and which will neither give, bend, crack, pucker nor warp, even under the greatest strain. Especially designed for the homes of bosses or operatives. The doubly secure process of erection warrants comfort, even in extremes of hot or cold weather.

QUICKBILT Bungalows are the most economical homes possible. They are made in large quantities according to patented methods in a systematic manner by a plant which covers the entire operation from the forest to the finished house. As a result with every short cut to perfection and economy afforded the cost of manufacture is cut in half and all extra middle-men's profits and commissions are avoided. They are sold direct to you from the forest.



Arriving already built with nothing left but the erection, the labor usually necessary for construction is reduced to a minimum. There will be no piles of waste lumber left. Every waste in material, time, labor and money is avoided.

The Most Logical, Modern, Practical, Economical Method of Home Building.

For fuller explanation address

QUICKBILT Bungalow Dept. E118,
A. C. Tuxbury Lumber Co.,
Charleston, - - South Carolina.

You are cordially invited to vis it our exhibit on the first floor of the Southern Textile Exposition

Tell It To Atlanta

HAVE you a new building project—mill, foundry, power house or the like—for which steel sash would be appropriate?

Tell our Atlanta representatives about it. They are competent engineers: they can look over your plans, make suggestions for the best application of our various types of sash, and answer your questions much better than we can at Philadelphia.

They can tell you what type of sash to use for a given ventilating result; whether to operate singly or in groups; how to provide for easy erection of the sash and for operating clearances.

The combination of your knowledge of Southern building practice with **their** knowledge of sash details and ventilating principles will be to the benefit of all parties concerned.

And it will save a lot of time for you.

Lupton Pivoted Factory Sash—*Cat. 10-LSS*
Lupton Counterbalanced Sash—*Cat. 10-LCB*
Lupton Steel Partitions and Doors—*Cat. 10-LSP*
Lupton Rolled Steel Skylight—*Cat. 10-Misc.*
Pond Continuous Sash, for Pond Truss roofs, monitors, sawtooths, and side walls—*Cat. 10-PCS*
Pond Operating Device for long lines of sash—*Cat. 10-PCS*

DAVID LUPTON'S SON'S COMPANY

Established 1871

Amber St. and Allegheny Ave. Philadelphia
1024-5 Candler Building Atlanta

Makers of Steel Sash Products for Industrial Buildings and Offices

Specialists in daylighting and ventilating equipment for maximum production

Agents in principal cities

Canadian Manufacturers: The A. B. Ormsby Co., Ltd., Toronto

"Today —— the Sash makes the Factory"

Lupton

INVESTMENT VALUE

The Favorite Flooring for Modern Textile Mills,
(—and Some of the Good Reasons.)

TUPELO

"Tupelo works easy and wears hard." *Most Economical Flooring for Textile Mills*

"WELL, THERE'S SOMETHING IN THAT."

TUPELO
("THE HARD-WEAR")
LUMBER

It is peculiarly valuable for TEXTILE MILL FLOORS, because, although it is a soft wood and therefore easily worked and laid, it has what scientists call an "involved" grain. This is a grain in which the fibres are "knitted" or "woven" together and results in extreme resistance to friction such as a floor has to withstand. TUPELO FLOORING DOES NOT TEND TO SPLINTER OR SLIVER. ("There's something in that.") This tough, wear-resisting characteristic of TUPELO is so great that this wood is largely used for FLOORING IN WAREHOUSES and for PLATFORMS WHERE HEAVY TRUCKING IS DONE. There is no harder test for a floor than that.

YOU WILL FIND IT ***WORTH WHILE*** *TO KNOW ALL ABOUT* ***TUPELO*** *BEFORE YOU PLACE YOUR ORDER FOR* ***FLOORING***

Ask us for Full Information about this valuable, dependable and, in the best sense, economical wood. Please address nearest office.

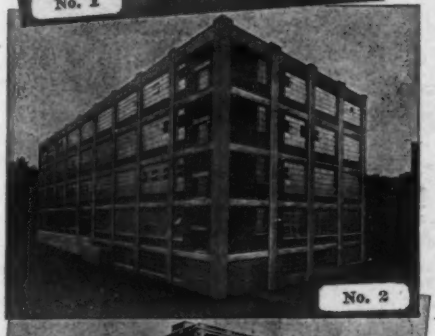
Southern Cypress Mfrs.' Association

805 HIBERNIA BANK BLDG., NEW ORLEANS LA., or 805 HEARD NATIONAL BANK BLDG., JACKSONVILLE, FLA

John W. Ferguson Company

Building Accomplishments

No. 1


No. 2

No. 3

No. 4

THE big thing about any Ferguson job is the amount of satisfaction it gives its owner.

Since the completion of the original contract, whenever any of the five concerns whose buildings are shown here have needed additional building, the work has been done by John W. Ferguson Company.

As a matter of fact, 85% of the firms Ferguson has served once, have expressed their appreciation by awarding all subsequent building contracts to this organization.

65-10

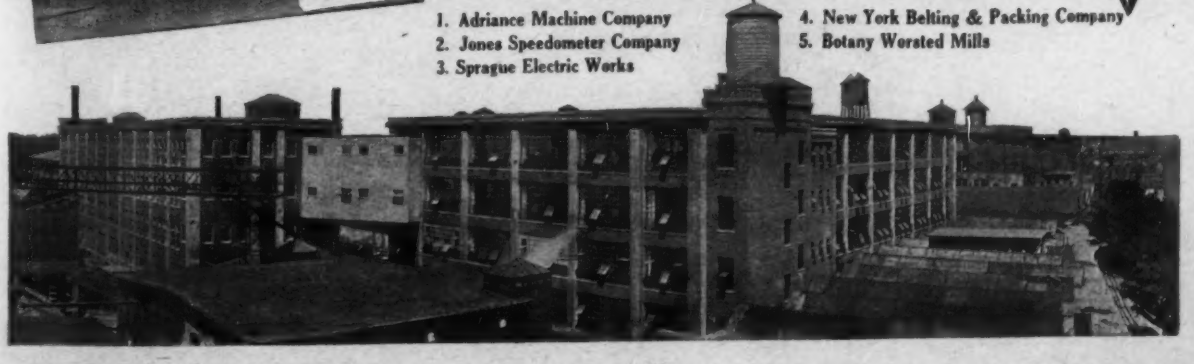
John W. Ferguson Co.

Engineers and Building Contractors.

PATERSON, N. J. NEW YORK, N. Y.

JOHN W FERGUSON COMPANY

1. Adriance Machine Company
2. Jones Speedometer Company
3. Sprague Electric Works
4. New York Belting & Packing Company
5. Botany Worsted Mills



TEN FAMILY REINFORCED CONCRETE APAR TMENT HOUSE BUILT FOR AVONDALE MILLS

The South's most progressive cotton mills have turned from frame to concrete construction

Mindful of their employees' welfare the progressive cotton mills have swung from frame to concrete construction for these very real advantages—freedom from repairs and replacements, freedom from vermin and fire, perfect sanitation.

ENSLEY BASIC SLAG

"THE coarse aggregate for re-inforced concrete construction."

here are four concrete examples

Columbus, Ga.

Substantial enlargements, practically doubling capacity, have been made recently by two of the largest cotton mills at Columbus—the Bibb Mfg. Co. and the Columbus Mfg. Co. Thousands of tons of "Ensley Basic Slag were used by T. C. Thompson & Bros. Co., contractors, as the coarse aggregate in this reinforced concrete construction.

Several hundred tons of slag were used by the Interstate Roofing and Foundry Co. (Anniston, Ala.) as the mineral aggregate for mastic floors and Barrett Specification roofs for these permanent buildings.

We now operate 2 plants

ENSLEY, ALA. 4,000 tons daily.

ALABAMA CITY, ALA. 2,000 tons daily.

Write or phone for prices covering your requirements—prompt shipments over nine railroads to all points in the Southeastern states.

Thomaston, Ga.

The Bibb Mnfg. Co. has also added permanent construction to their Peerless Cotton Mills at Thomaston, Ga. It was our privilege to supply the contractor, Algernon Blair of Montgomery, Ala., with several thousand tons of "the coarse aggregate for these reinforced concrete structures.

Our No. 6 Roofing Slag was used by C. P. Murphy & Sons of Atlanta in the permanent "built up" roofs. Even the floors will be wear-proof as hundreds of tons of No. 3 slag were used in the laying of the mastic floors.

Piedmont, Ala.

The Coosa Mills at Piedmont, Ala., in recent enlargements specified "built-up" roofs (both fire and waterproof) and mastic floors. The Interstate Roofing and Foundry Co. employed "Ensley Basic Slag" exclusively in this construction.

Birmingham, Ala.

Owners of Avondale Mills are among the biggest users of Ensley Basic Slag. The 10-family apartment house, shown above, a large Community House and a modern laundry and ice plant are notable, recent expressions of their faith in reinforced concrete structures.

In recent years they have used thousands of tons of slag in the construction of permanent buildings, houses, streets and roads for their properties at Birmingham, Sylacauga and Alexander City.

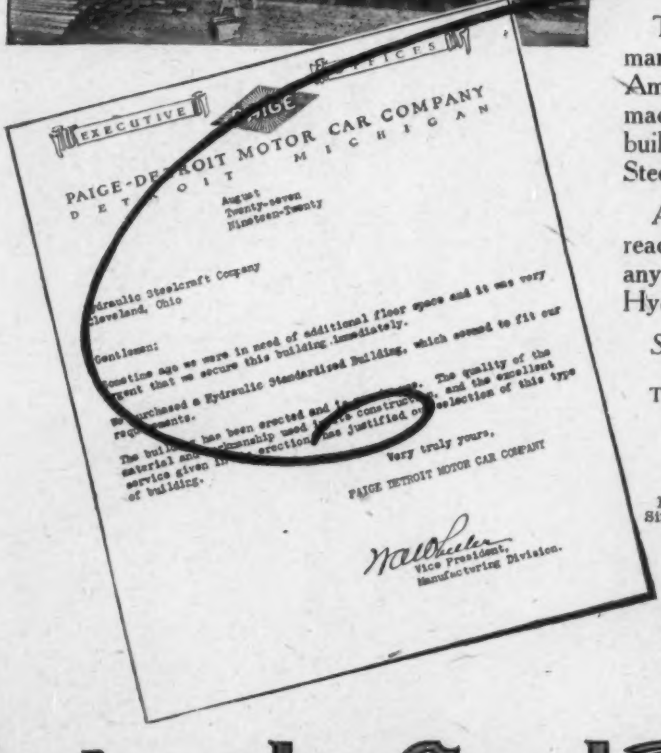
Birmingham Slag Company

Branch Sales Office
84 Marietta St.
ATLANTA, GA.

Home Office:
BIRMINGHAM, ALA.

Branch Sales Office
Williams Bldg.
THOMASVILLE, GA.

Justified!


EXECUTIVE OFFICES

PAIGE-DETROIT MOTOR CAR COMPANY
DETROIT MICHIGAN

August
Twenty-seven
Nineteen-Twenty

Hydraulic Steelcraft Company
Cleveland, Ohio

Gentlemen:

Sometime ago we were in need of additional floor space and it was very urgent that we secure this building immediately.

We purchased a Hydraulic Standardized Building, which seemed to fit our requirements.

The building has been erected and is [illegible]. The quality of the material and workmanship used in [illegible], and the excellent service given in [illegible] erection, has justified our selection of this type of building.

Very truly yours,

PAIGE DETROIT MOTOR CAR COMPANY

Wal Wheeler
Vice President,
Manufacturing Division.

The Paige-Detroit Motor Car Company—manufacturers of "The Most Beautiful Car in America"—needed a warehouse *in a hurry*—made a careful investigation of buildings and building construction, *then* selected a Hydraulic Steel Building.

A complete building shipped, erected and ready for use in less time and at less cost than any other permanent construction is what Hydraulic *delivered.*

Several types in stock—quick shipment.

THE HYDRAULIC STEELCRAFT COMPANY
of THE HYDRAULIC STEEL COMPANY
CLEVELAND, OHIO

Branch Sales Offices

New York	Chicago	Detroit	San Francisco
Singer Bldg.	Fisher Bldg.	Book Bldg.	Hearst Bldg.

Hydraulic Steel Buildings are made in many types and have a wide application of uses; Warehouses, Factories, Machine Shops, Foundries, Garages, Bunk Houses, Shop Restaurants, Pump Houses, Oil Refineries, Transformer Sheds and Storage Buildings.

Hydraulic Steel Buildings

Standardized

Keeping Up-Keep Down

BUSINESS executives of mills are realizing more than ever the importance of systematic up-keep of buildings and mill equipment.

The liberal use of paints, their careful selection as to quality and purpose, are prime factors in the economical up-keep of your property.

Service Department

Practical paint men of long years experience and thorough knowledge of the needs of Cotton Mills, are here to advise you.

Whatever your paint requirements may be, put them up to these men. They will be helpful to you in solving your paint problems.

Varnishes—Stains—Enamels

are the results of more than fifty years experience and research to meet the requirements of mills.

Each Pee-Gee Product is made for a specific purpose and will give you longest service at lowest possible cost.

A protecting coat of Pee-Gee Mill Paint or Varnish will insure your buildings and machinery against decay and keep down the cost of up-keep.

Write today for Booklet on "Pee-Gee Mill Paints"

Peaslee-Gaulbert Company, Inc.

PAINT GRINDERS—VARNISH MAKERS

Established 1867 **LOUISVILLE, KY.**

The Most Dependable Concrete-Reinforcing Material

The ribs on the Corrugated Bar are carefully designed so that the bond with the concrete is absolutely dependable.

Careful tests of plain bars, twisted bars, and various deformed bars used as concrete reinforcement have proved the Corrugated Bar to have the strongest bonding value.

The bonding value of a very smooth and a very rough plain bar has been found to vary from 70 to 700 pounds per square inch, a variation of a thousand per cent. With such an unreliable material it is necessary to use much more steel than is really needed for strength.

The shape of the ribs on the Corrugated Bar is such that the bond with the concrete is certain and definite, and can be depended upon whether the surface is smooth or rough. The ribs are at right angles to the axis of the bar, and bear squarely against the concrete, thereby preventing sliding without any tendency toward splitting.

The Corrugated Bar Company, Inc., has been established for more than 25 years. It has devoted its energies exclusively to the development of materials for concrete reinforcement, and to the designing of reinforced concrete structures. The CORRUGATED BAR is the oldest and best-established of all bars designed especially for concrete reinforcement.

Corrugated Bar Company, Inc.

Buffalo, N. Y., U. S. A.

District Sales and Engineering Offices:

New York, N. Y.	Houston	Philadelphia	St. Paul
Kansas City	Boston	Milwaukee	Syracuse
Chicago	Atlanta	St. Louis	Detroit

For engineers, architects, contractors and students of reinforced concrete construction we offer a handbook "Useful Data on Reinforced Concrete Buildings." Price $2.50.

We Carry in Stock Standard Sizes of

Corrugated Bars

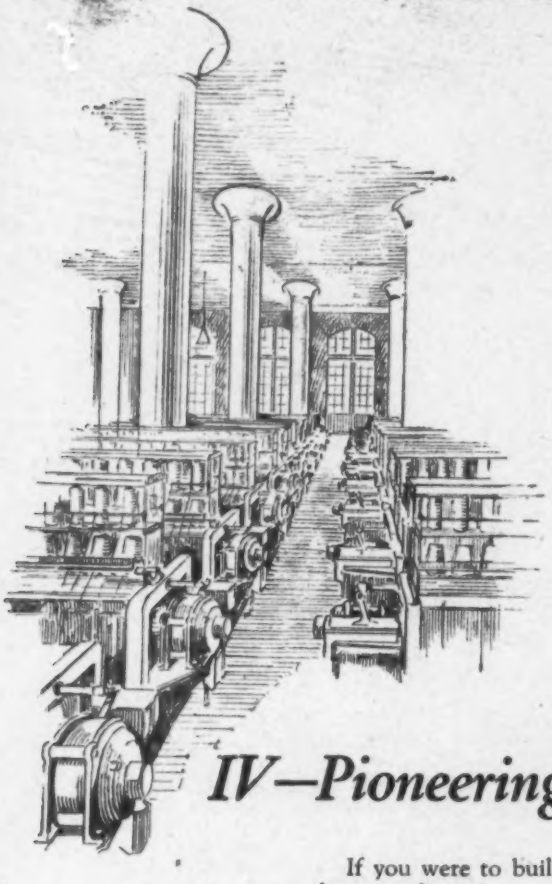
which have areas equivalent to

⅝ in. Round, ½ in. Round, ½ in. Square, ⅝ in. Round, ¾ in. Round, ⅞ in. Round, 1 in. Round, 1 in. Square, 1¼ in. Square, 1½ in. Square.

American Can Co. Bldg., Newark, N. J.: Contrs. — American Concrete Steel Co., Newark, N. J.

Corrugated Bars

THE FUNCTIONS OF THE ENGINEER



IV—Pioneering for Future Production

If you were to build your old plant again, would you follow the same design?

Yet you see here and there a plant whose layout and construction, even after ten, fifteen, twenty-five years, show little need of a change.

Back of every such plant was the plan of a farsighted Engineer who anticipated the demands of a later generation and, like the hardy, cool pioneer, set his judgment to the task of preparing for new conditions. He balanced his plan so that by a succession of additions or modifications progress could be maintained without incurring unnecessary expenditures.

The Engineer is trained to forecast the contingencies of service and development and to select their obvious solution.

If you are planning a new factory, an addition or alterations to your existing plant, one or more of the booklets described below will interest you. Indicate your choice and we will gladly forward them.

J. E. SIRRINE and COMPANY
Engineers

GREENVILLE
SOUTH CAROLINA

331 MADISON AVE.
NEW YORK CITY

SERVICE

"FACTORIES FOR THE FUTURE."

"CONTENTMENT UNDER ROOF"—industrial housing development.

"PICKS TO THE MINUTE"—about textile plants.

"RIVERS IN HARNESS"—hydro-electric development.

The Carolina Mills, Winston-Salem, N. C. *J. E. Sirrine, Architect; Fogle Brothers Company, Contractors*

WindoWalls—for Bright, Cheerful Workrooms

YOUR mill is either modern or old fashioned. WindoWalls are the deciding factor. No matter how well designed—how efficient the layout, without plenty of daylight and fresh air your mill is behind the times.

These two natural elements are of vital importance to the welfare of your business. They promote cheerfulness and alertness in your employees which, naturally, increases production and profits.

The Carolina Mill Company's building at Winston-Salem, N. C., is is a typical example of the bright, cheerful workrooms secured through the installation of Fenestra WindoWalls.

W. L. Siewers, president of the Carolina Mills, wrote us:

"We consider Fenestra Steel Sash satisfactory in every way. Fenestra gives more light than the old style wooden sash, is easier to operate, and the maintenance cost is considerably lower."

6,019 square feet of Fenestra Steel Sash daylights 25,000 square feet of floor space in this Carolina Mill building.

Detroit Steel Products Company
4214 East Grand Boulevard, Detroit, Mich.
Canadian Metal Window & Steel Products Limited, Toronto, Canada

Fenestra
STEEL WINDOWALLS

CONCRETE ROAD UP LOOKOUT MOUNTAIN, TENNESSEE

Speaking of

CONCRETE ROADS

More than 5,000 miles of concrete pavements on the basis of an average width of 18 feet were placed under contract in 1919.

Every state—your state—contributed to this wonderful record.

Below are the states in which contracts for more than 30 miles of concrete road were let during 1919

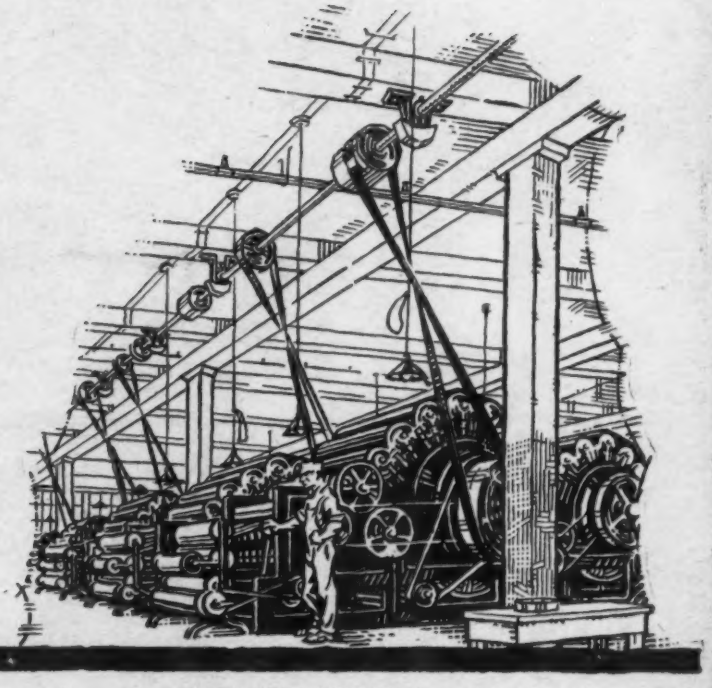
	Miles		Miles
Arkansas	87	New Jersey	87
California	210	New York	329
Delaware	55	Ohio	239
Georgia	90	Oklahoma	69
Illinois	570	Oregon	42
Indiana	280	Pennsylvania	491
Kansas	69	Texas	59
Maryland	95	Utah	84
Massachusetts	31	Virginia	91
Michigan	169	Washington	161
Minnesota	79	West Virginia	87
Mississippi	38	Wisconsin	132

North, east, south and west—
CONCRETE is the choice.

DIXIE PORTLAND CEMENT CO., CHATTANOOGA TENN.

OJACO

MILL·WHITE



WASTE—waste—waste! Tons of wool lost each year in carding alone. Yards of finished product lost by this great source of shrinkage. Stop it! End it now!

Natural daylight will help. Take advantage of the generosity with which Nature furnishes all revealing light. Put this light to work at the simple cost of treating the walls and ceilings of the mill with OJACO Mill White. It makes the sunshine do double duty—it makes the sun an efficient instrument in production by reflecting its light, properly diffused and softened. The whole story is yours if you write, wire or 'phone an inquiry to

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FOR

TEXTILE MILLS AND INDUSTRIAL PLANTS

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U. S. Government Built Bungalows

DELIVERED TO YOUR STATION AT

$650.00

These U. S. Government built bungalows are built of yellow pine; shipped in sections and stenciled so that they can be erected without skilled labor. The bungalow consists of three large rooms and porch, living room 12 x 15, bed room 10 x 12, kitchen 8 x 14; porch 8 x 14; size over all 25 x 28—has 17 windows (glazed), also 17 screens for same (including hardware), all wired for electricity.

Outside of house is painted with finished coat, inside of house is unceiled. Has 4 doors (two glazed, for outside doors, and two solid panel doors for inside).

Has one partition inside separating the bedroom from living room and one separating the kitchen. Two sets of steps (for front and rear entrances), one smoke pipe. These bungalows are ready for prompt shipment and at the present rate of freight, we deliver to your nearest freight station for the sum of $650.00. Terms, deposit of $150.00 with order on each house, balance draft against bill of lading.

Under present conditions these homes would cost about $1,500.00 to build. The low price at which we are selling these houses enables anyone owning a lot to have a home at very low cost. We have but a limited number of the bungalows left and we are offering them subject to prior sale.

ALSO HAVE SEVERAL LARGER BUILDINGS RANGING IN PRICE FROM $1,750. TO $2,500
PHOTOS OF BUNGALOWS AND BUILDINGS ON REQUEST.

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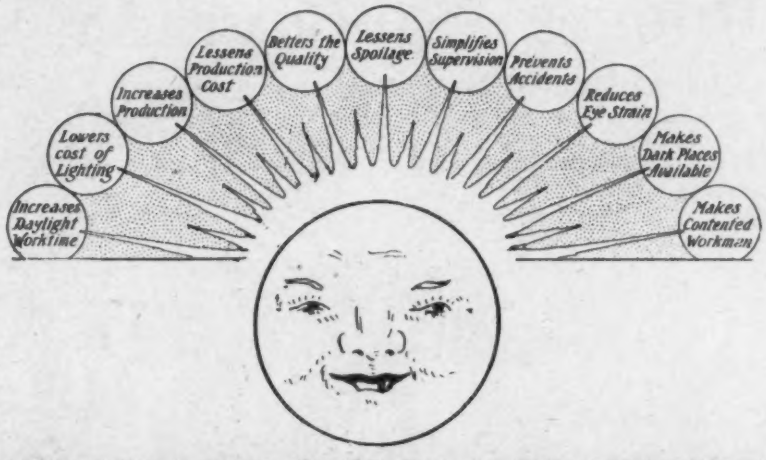
BRUNSWICK, GEORGIA

WE CAN SAVE YOU 1/3 ON BUILDING MATERIAL. CLOSING OUT ENTIRE $200,000 STOCK OF SASH DOORS, WINDOWS AND LUMBER OF OUR BRUNSWICK, GA., WAREHOUSES

SCO-CO COTTON WHITE



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—MADE RIGHT TO STAY WHITE—

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Permanent—Moistureproof—Washable

Many Mill Whites are made cheaper than Cotton White—None are made better.

Cotton White delivers a greater percentage of light over a longer period of years than any similar product.

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Paint Products Division
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MILL WHITE PAINTS
B.P.S. MILL WHITE
will not turn yellow
It is an intense white that reflects and disseminates all light available, thereby reducing the amount of artificial light necessary.
Three finishes
FLAT — EGGSHELL — GLOSS
Can be brushed or sprayed.
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NEW YORK
CHICAGO
KANSAS CITY
Best Paint Sold

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Armour's newest plant in South St. Paul is the eighth Armour plant now using Elastikote, B and P Enamel and other Tropical products.

Armour's first order for Tropical products was placed in 1912. Each year since then, this nationally prominent concern, has reordered Tropical products.

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ELASTIKOTE

is a Tropical product prepared especially for the protection of industrial buildings. It is not affected by smoke, fumes or gases. Send for sample sheet painted with Elastikote and test its wonderful elasticity.

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Condulet the Job

Boost Production With Safe Motor Switches

TO GET the utmost production every safeguard should be used to prevent interruptions. Electrical interruptions may be guarded against by Conduleting your machines.

ZY Condulets are designed for small motor driven machines and are especially suitable for textile installations.

The switch mechanism is out of the ordinary, being of a very sturdy design. It is protected from mechanical damage and from dust and lint by a substantial cast iron housing.

Last but not least these Condulets are safety-first devices in that the live parts are not accessible when the door is open.

For full description of these and other Condulets write for catalog.

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Condulets Panelboards
Knife Switches Floodlights
Guy Anchors

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Cutter Holder Socket Reflectors with Westinghouse Mazda Lamps

These reflectors are designed and manufactured according to the latest and best illuminating engineering practice and give types of light distribution, which has been found by exhaustive tests, in laboratories and in service, to be the most suitable and efficient for all lighting installations to which metal reflectors are adapted.

These reflectors are available in such a wide variety of sizes and types that on practically every occasion the reflector may be selected to prove ideal for the requirements.

Our illumination engineers will be pleased to study your requirements and submit recommendations and specifications describing accurately the material best suited to the conditions.

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WESTINGHOUSE ELECTRIC

Westinghouse Electric & Manufacturing Co.,
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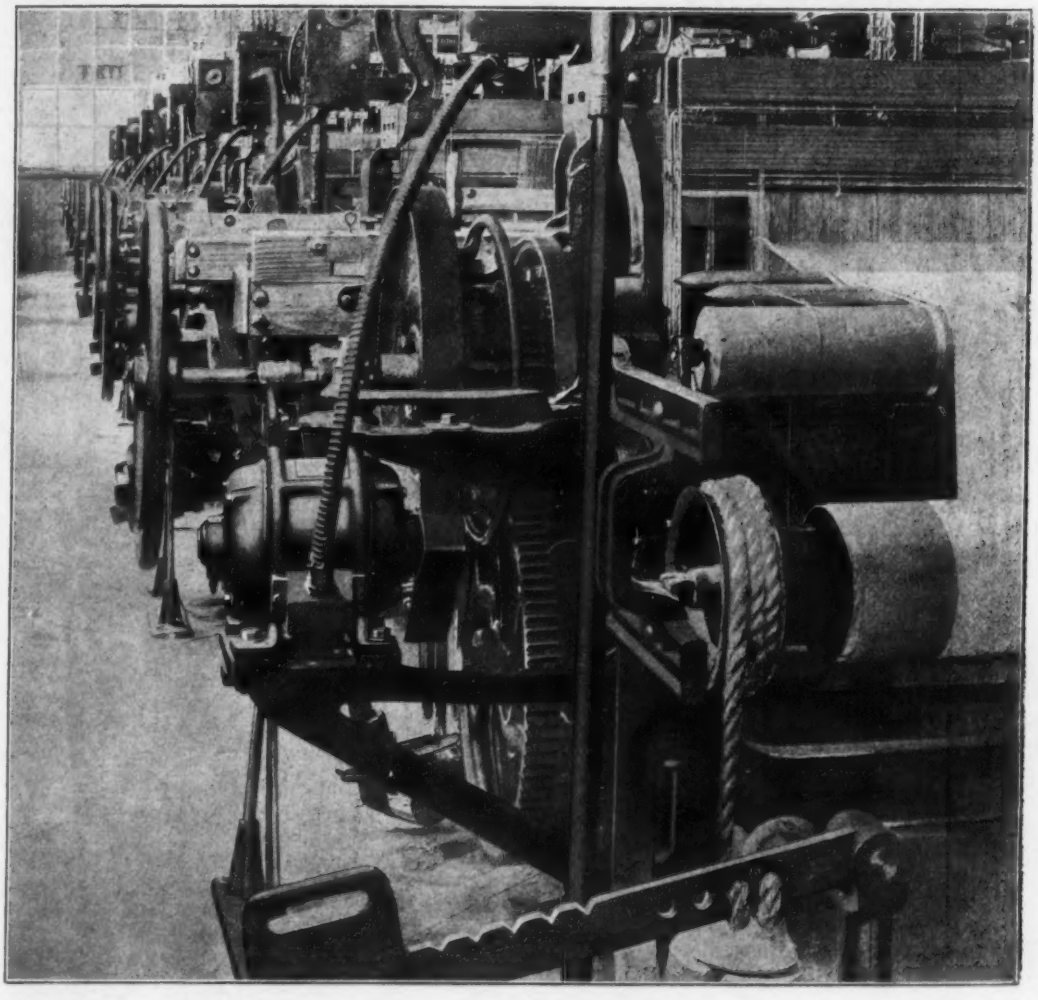
Loom Motors



Allis-Chalmers Loom Motors are totally enclosed, have waste packed bearings and are arranged for conduit connections.

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Milwaukee, Wisconsin, U. S. A.
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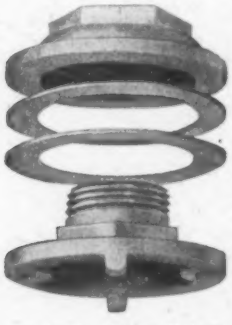
Benjamin Reflector Sockets

With X Type Fitting

Benjamin R. L. M. Dome Reflector Socket with X Type Fitting and Benjamin Two-Piece Easy-to-wire Socket.



Benjamin X Type Fitting

Benjamin Two-Piece Easy-to-wire Socket

The Illumination Equipment You Will Select When You Consider CORRECT INDUSTRIAL ILLUMINATION

Weather, Strain and Corrosion Resisting Seamless

Industrial executives, recognizing the vital part played in production by correct industrial illumination, will rightly give the deepest consideration to Benjamin Illumination Equipment. It is expressive of the best Engineering practice, upon which Correct Industrial Illumination is founded.

Benjamin Reflector Sockets faithfully represent these ideals. The Benjamin reputation is behind the assurance that this equipment will fulfill the most exacting Industrial Illumination requirement.

Benjamin Reflector Sockets Are Seamless These reflector sockets are unusual in that they are deep drawings from one piece of steel—seamless.

Porcelain Enameled The bare steel drawing is covered—two coats outside and three coats inside—with porcelain enamel fused on to the steel. The surface presented has highest illuminating values, is acid, gas, heat and moisture resisting—and is as easily cleaned as a china bowl.

The X Type Fitting Developed as the result of years of practical experiment. Plenty of bearing surface. Easily separated and reassembled. Binds the reflector firmly in place and resists the strain, corrosion and weathering imposed by outdoor conditions.

The Two Piece Socket All porcelain, very heavy and rugged in construction. Fitted with the Benjamin Lamp Grip which prevents the lamp bulb from loosening under shock and vibrations.

Through the special construction of Benjamin Reflector Sockets—all types—the lamp and all electrical parts are supported directly by the stem. This relieves them of all outside strain.

Benjamin Illumination Engineers will gladly confer with your own architect, contractor or jobber on any question involving this equipment or the subject of Industrial Illumination.

Write the Advertising Department, 806 W. Washington Blvd., Chicago

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Sales and Distribution Offices

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The following are divisions of Benjamin products on which we will be glad to send you information:

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Pressed Steel Products Division
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A VAT DYE for fast color ginghams and chambrays
Excellent fastness to washing and Chlorine
Entirely suitable for dyeing yarn and raw stock

THE DOW CHEMICAL COMPANY — MIDLAND, MICHIGAN

MIDLAND

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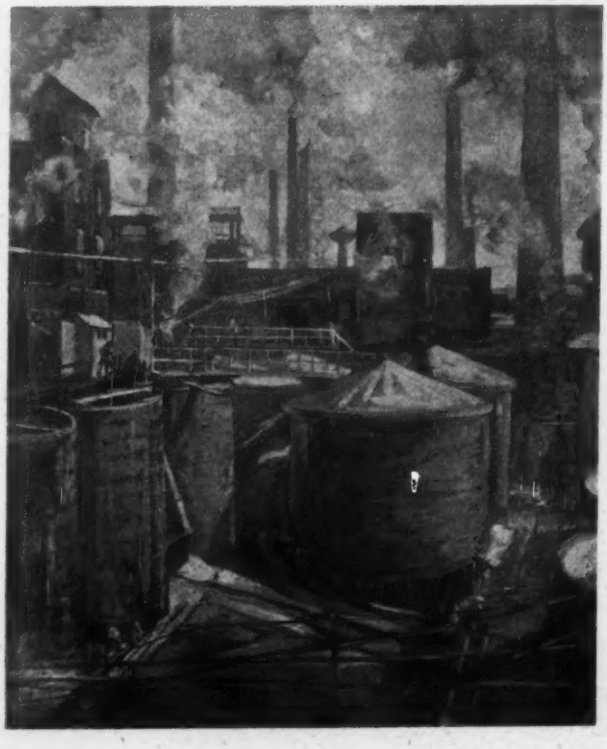

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ANILINE DYES and CHEMICALS, Inc.

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Use Ivanhoe

After you have provided your factory with all the daylight possible, and have painted the walls white to conserve your light, you still have not provided good working conditions at night, on dark days and during the innumerable dark hours in late Fall and Winter afternoons; you have not taken care of the dark corners that daylight can not reach; and you have not secured a light of known intensity, controlled at will according to your needs. No factory manager has a right to be satisfied with his working conditions until he has the most effective electrical lighting system possible to devise. IVANHOE manufactures high grade lighting equipment, and, if you desire, will put you in touch with a local lighting man competent to advise with you about your requirements.

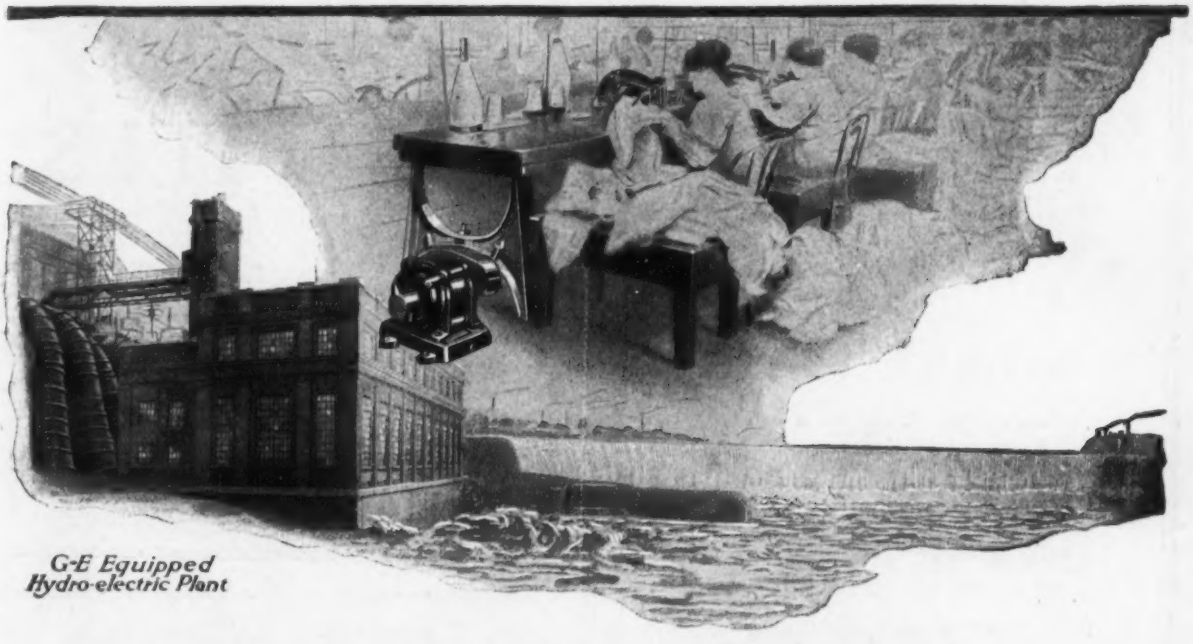
IVANHOE-REGENT WORKS
of General Electric Co.
CLEVELAND, OHIO
"Ivanhoe" Steel Reflectors, Lighting Glassware, Anderson Self-Adjusting Arms, and Illuminating Service.

"Service to Lamps"

IVANHOE

SHADES-REFLECTORS

In many cities production can be increased, its quality improved, and new industries added by efficiently making and using the available power



G-E Equipped Hydro-electric Plant

How electricity increased and improved a textile city's production

EACH mill in a certain textile city was driven by its old water-wheel—production was low, so was quality.

In summer, low water and leaky canal beds slowed up the wheels—in winter, anchor ice did the same.

Finally, G-E textile mill specialists were called in to suggest a better way of using the water power.

A central water power plant was built to supply all mills with electric power and provide a surplus for new industries.

Electric drives at each mill applied power directly to productive machines, and losses due to mechanical drives were largely eliminated.

Machinery was enabled to operate at a constant maximum productive speed.

Its output was increased 35% and a very much better product resulted.

Any community's efficiency may be increased manifold by the proper utilization of Nature's resources and the application of electricity in homes, industries or on farms.

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

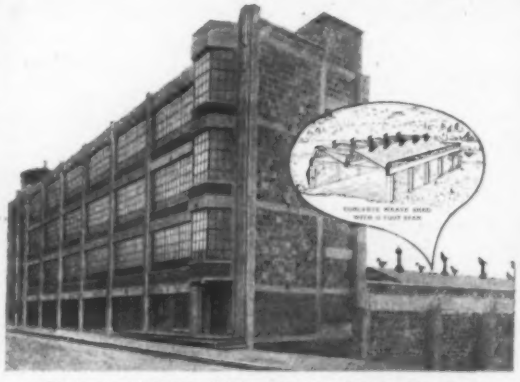
MILL POWER DEPARTMENT, BOSTON, MASS.

Look for this mark of leadership in electrical development and manufacture

G-E motors

From the Mightiest to the Tiniest

GENERAL ELECTRIC COMPANY



Factory, and Weave Shed with 42-foot Span Concrete Saw-tooth Roof. Designed and constructed for Sidney Blumenthal & Co., Inc., at Shelton, Conn.

An incomparable weave shed

—42 x 160 ft. without a column
—successful anti-condensation and sound-deadening treatment
—built of concrete

SIDNEY BLUMENTHAL & Co., Inc., gave us a carte-blanche contract for a weave shed. We designed and built a model weave shed, better suited to its use than any other in existence.

A photograph of this weave shed and adjoining factory (also designed and built by us) is reproduced above.

This client has awarded us five consecutive contracts.

THE ENDICOTT-JOHNSON WORKERS have chosen us to do the designing, engineering and construction of all concrete buildings to be erected by them DURING 1920.

THOMPSON & BINGER
INC.
ENGINEERS & CONTRACTORS
CONSULTATION - DESIGN - CONSTRUCTION

NEW YORK
280 MADISON AVE.

SYRACUSE
GURNEY BUILDING

CONCRETE

FIBRE RE-ENFORCED SHAMBOW SHUTTLES

BOOST OUTPUT
CUT COSTS

Woonsocket, R. I.

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IT takes a good brush to stand the use and abuse of long and severe service, and mill men recognize the superior quality of

FELCO BRUSHES

They are made from the best material and by expert workmen.

There is a brush for every use at the lowest price consistent with the high standard of quality.

Departments are maintained for the repairing and refilling of worn out brushes.

ATLANTA BRUSH CO.
Successors to
D. D. Felton Brush Co.
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Felco Curved Floor Sweep for Spinning Room Alleys.

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L. L. ARNOLD, Editor. **R. W. Philip, Associate Editor.**

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Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

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Member Associated Business Papers, Inc.
Member Audit Bureau of Circulation.
This Issue 6,200 Copies.

Volume 84 **Number 12**

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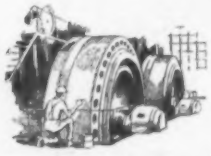

Buying paint for the protection of metal surfaces from rust and wear is no longer a haphazard experiment. It is an important investment, worthy of severe contemplation.

With the high cost of labor in mind, the "cost per gallon" of paint is not the deciding factor, but how long does the paint last on the job?

DIXON'S
Silica-Graphite
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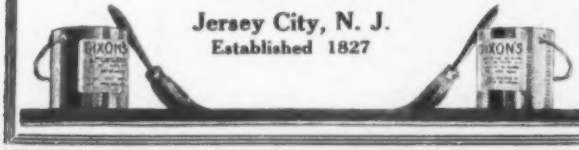
has won the enviable reputation for long service with satisfaction in all parts of the world. Graphite is not affected by sunlight, heat or cold, acids or alkalies, and it has no enqual in withstanding dampness.

Silica is equally impervious and is to graphite paint what copper is to gold in a watch-case. It resists wear and anchors the film.

Write for Booklet No. 34-B.

JOSEPH DIXON CRUCIBLE CO.

Jersey City, N. J.
Established 1827



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GENERAL UTILITIES COMPANY

Wherever the routine of your mill requires a single pair of hands to pick something up, to carry it, to lay it down again, there is the chance to eliminate all three movements, plus part of their cost, by the use of the proper conveying or elevating machine.

Our Engineering service, which includes a survey and consultation at your factory, blueprints, quotation, all without obligation, is cordially offered you.

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Put an end to claims for shortage, once and for all times. Use end-stamps and prevent come-backs. Then you're protected.

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(Dry) Transfers
"The Practical Way"

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Sole Manufacturers

GARLAND

IF YOU ARE NOT
QUITE SATISFIED NOW

Try a GARLAND Standard Grade
LOOM HARNESS

No better looking, better weaving or better wearing loom harnesses can be made than those we are turning out. The best materials, great care in manufacturing and rigid inspection from the knitting to the finished harness are bound to produce harnesses of superior quality.

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TRADE MARK

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SACO, MAINE

With the Publishers—

"THE war has taught us many things. It was largely won by advertising. The Liberty Loans were sold because of the skill with which they were advertised. Before conscription the British army was recruited by advertising. * * * * As a result, the art of advertising has been studied and improved, it has been dignified, its psychology is better understood and its value more appreciated than ever before."—Theodore H. Price in a recent article.

"AFTER reading COTTON for September, I want to congratulate you upon the article entitled 'Domestic Science and Saleratus.' That part of it showing an application of home economics, and other phases of domestic science, comes more nearly being the exact needs of the cotton mill employees than has been stated in any publication that I have read on this subject. * * * * If you can persuade the executives to adopt the plan, practical results would soon be so self-evident, and so beneficial to both employer and employee that they would want to erect a monument to you for showing them the way."

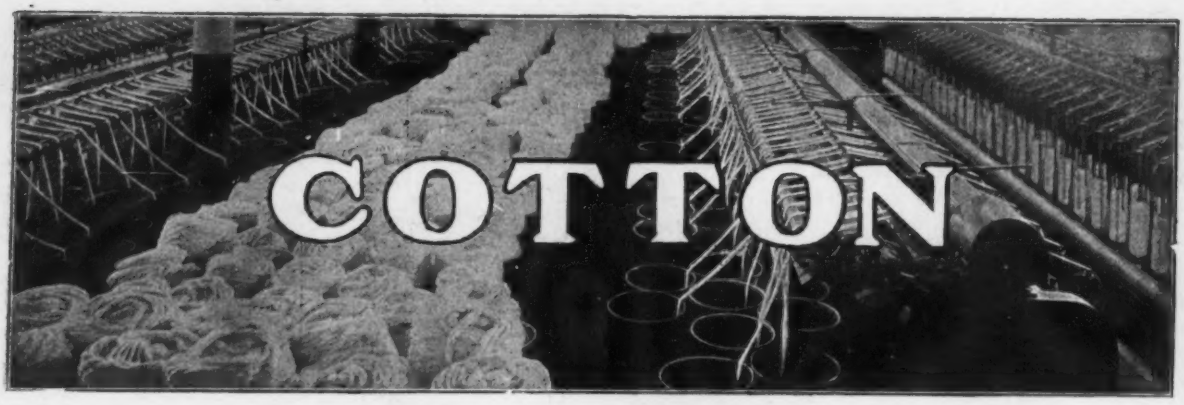
(Signed) J. F. Trazzare,
Mgr. Employment and Public Relations
Georgia Railway and Power Co.

AMONG COTTON'S READERS

J. E. Sirrine
Mill Engineer and Architect
Greenville, South Carolina

"Your magazine, COTTON, is one of the few I never fail to read, not only because of its timely articles on all questions affecting the textile industry, but also because of the high stand it takes on all public questions."

J. E. Sirrine



October, Nineteen-Twenty

Some Wartime Vagaries.

You may believe the war is over. You may have read reams about the peace treaty and, possibly, have seen pictures of some of the leading characters abroad in the very act of signing what purported to be the peace treaty. You may even have observed that the railroads have ostensibly been returned to their respective owners. If, from any cause, you have had occasion to ride upon one of them you have also observed that you paid the old rate, plus the war increase, plus the twenty per cent addition for wage increases, plus an eight per cent war tax. For some reason Congress failed to list this tax as a luxury tax, possibly because most congressmen learned differently in using the mileage which they had set aside for personal use.

This luxury tax is a curious thing. Webster defines "luxury" as the "free indulgence in rich diet or costly dress or equipage; anything delightful; a dainty." If Webster had lived long enough to experience the last few years of prosperity he would have eliminated that word "free." It is no longer used in connection with either luxuries or necessities. But to get back to that luxury tax, suppose you desired to mount the baby's picture, or to make a scrap book of witty remarks from the Congressional record or paste a reminder slip in your hat that your wife wanted you to water the fern regularly while she was away, you would hie you to the corner drug store and buy a tube of library paste. On careful examination you would find that the clerk had failed to affix a little blue stamp thereto, affixing an additional two cents to the purchase price at one and the same time. This is because library paste is a necessity. Webster says a necessity is something that is unavoidable, hence library paste is unavoidable unless you prefer to use glue, which is also a necessity and therefore not taxed. Undoubtedly you prefer the library paste, it smells better and as it is unavoidable you purchase it.

While you are sojourning in the corner drug store it occurs to you that you have a desire for luxury, for something delightful, a dainty, so to speak, and you therefore order a tube of tooth paste. Ah! This time the little blue stamp is in evidence and the charge is thirty-seven cents or forty-one cents or some such odd combination which usually hall-marks a luxury. Tooth paste, you understand, in the opinion of Congress is not unavoidable, hence it is a luxury.

You may wonder a bit as you compare your two purchases. Library paste is white and scented and is a necessity, as that scrap book is unavoidable, especially if you chance to be a congressman. Tooth paste is white and scented and is not a necessity as you can eat onions if your breath becomes odoriferous from unsanitary teeth. Perhaps that is why Congress placed chewing gum in the list of unavoidables. Chewing gum is highly odorous; it smells somewhat like a mint julep but has no kick; after the smell is extracted the residue resembles glue. Perhaps it is glue. However, its consistent use prevents your friends and acquaintances from discovering that you are foregoing a dainty like tooth paste. But your dentist will remind you of it later—when he presents his bill.

Congressmen are peculiar birds when it comes to laying taxes. For instance, you go to your doctor and tell him you need some pills, he looks wise, writes a prescription, collects three dollars and you go once more to the corner drug store. The druggist charges you seventy-five cents and delivers the unavoidable, the necessity, the pills. You examine them. The doctor may have played a mean trick and had something put up in a capsule, on the other hand he may have ordered six prepared pellets. If the latter chances to be true, you examine them carefully and you recognize the brand, then the unavoidable is no longer the unavoidable, it has become something delightful, a dainty if you please, because you may now go over to another counter and purchase a box of these dainty pills for about a cent apiece, but because of your extravagance in doing so, Congress immediately orders that a blue stamp be affixed and charges you two cents for the luxury tax.

Under the Constitution congressmen are necessary or unavoidable—hence, they are not taxable, but, you, you poor simp of a manufacturer, you're not mentioned at all in the Constitution except as to being free and equal. As has already been indicated, the word "free" is now obsolete, hence you are only equal to or identical with something that is not necessary, a luxury, ergo, you are taxable. If this reasoning is not entirely clear to you it is because you show a lack of comprehension concerning governmental procedure. If you will direct an inquiry to the department of internal revenue, they will doubtless be glad to send someone, familiar with the workings of the con-

gressional mind, to enlighten your darkness and increase your tax.

No, Mabel, the war is still with us.

House Cleaning Necessary.

That the time to clean house in Washington is overdue is brought to mind every little while by some of the pamphlets and reports issuing from some of the many "bureaus" in that bureau infested city. The latest is United States Health Bulletin No. 106, recently issued as an official public document under the auspices of the Treasury Department. That this bulletin is "essentially unscientific and not justified by the data offered," is the conclusion of the National Industrial Conference Board in a special report entitled "Unwarranted Conclusions Regarding the Eight-hour and Ten-hour Work-day."

"Misleading, unwarranted and unscientific conclusions," says the Board's report, "are always to be deplored, but when such conclusions, carrying the weight of government sanction and bearing upon a highly controversial subject, are stated dogmatically and without qualification, they are dangerous."

The bulletin in question undertakes to compare a thoroughly established and highly efficient plant manufacturing automobiles and running on an eight-hour schedule, with a rapidly expanding munitions plant making brass fuses for three-inch shells and operating on a ten-hour basis. From the meager information thus obtained the investigator draws broad conclusions that are stated without qualification. Such conclusions can have no possible weight or bearing as applied to your cotton mill, for example, but the Conference Board finds they have been given wide publicity and accepted at their face value as the results of scientific study bearing the official sanction of the Government. Instances are noted in the Board's special report in which the conclusions of the Government's document are quoted with no qualifications and as if they were the final and certain results of scientific investigation.

"There can, therefore," the Board finds, "be no question that the difficult problem of industrial readjustment now pressing upon the country will be further complicated by the unqualified and dogmatic phrasing of the conclusions presented in the Bulletin. . . . The official sanction behind the publication of these conclusions gives them special prestige in the minds of many people. It is always against public interest for unwarranted and unscientific statements relating to any important problem to be given publicity, whatever the source may be. In these days of industrial unrest it is especially unfortunate if that source is an agency of the Government. Such is the condemnation that can justly be leveled against Public Health Bulletin No. 106."

The reason such reports are allowed to see the light of day is usually because bureau heads are too busy, getting out a quantity production in an endeavor to demonstrate the desirability of continuing their respective bureaus with an increased appropriation, to personally investigate the quality of twaddle being issued; the details frequently being left either to a fanatic with a hobby or worse. And Congress is spending around five billions of dollars annually, a part of which goes to keep these institutions for the feeble-minded in full blast. You may take that last sentence either way you please, as voters who fail to communicate with their representative and signify their disgust with such congressional recklessness deserve the classification.

It would seem as if an efficiency expert was badly needed in Washington. It might be well to secure a man like Hoover as general manager of bureaus to get them down to "brass tacks" and to delete those found superfluous. A salary of half-a-million or thereabouts might be well expended, and as the work would be lightened as the bureaus decreased in number, a reasonable decrease might be forecasted, with possibly an increase in efficiency in those remaining.

Friction Causes Fires.

Investigation of a number of recent cotton mill fires point to unnecessary friction as the cause. As a few examples we give the following:

A fire occurred in the carding room on the third story of No. 4 Building, due to a hot bearing.

A fire occurred in a slubber on the first floor of No. 2 Mill, caused by a hot box on top cone shaft. The fire extended along the full length of the machine, both front and back. One large and several small chemical extinguishers were used in putting out the blaze and the damage was confined to stock.

Due to a hot box at one of the looms, a fire occurred at 4 p. m. in the weave room on the third story.

A hot bearing on a drawing frame in the card room on third floor of the mill ignited sliver, causing the flames to flash over the top of a number of full roving cans.

A fire occurred in the weave room on the second story of No. 2 Mill, caused by friction of loom pulley.

Due to a hot bearing, a fire occurred in the weaving department on the second floor of Mill No. 2. Two sprinklers operated and checked the blaze and two hose streams were used by the mill employees.

A fire occurred in a slubber, operated on the first floor of No. 2 Mill. It was caused by a hot box on top cone shaft.

A fire occurred on the second floor of the raw stock dyehouse, apparently caused from hot bearing igniting loose dry cotton on the floor at the discharge end of the cotton dryer. There were several thousand pounds of cotton on the floor and this was burned over the top and the woodwork around some of the windows was also damaged. Nineteen sprinklers opened and one hose stream was also used, the fire lasting about half an hour.

A fire occurred in the napper room, which is located in the basement of the weave building and contains eight large and twelve small napping machines. The fire started at the No. 2 machine, caused by an overheated bearing, and spread to the four adjoining machines. The accumulation of napper dust aided in spreading the fire, which was drawn through the dust pipes and fan to the napper dust house where one sprinkler opened and controlled the fire. The mill help immediately brought a small hose stream into use and later a large stream.

Why not eliminate frictional fires by the use of ball or roller bearing equipment?

The Doffing of Twisters

BY F. ICACIOUS.

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After a long experience in various conservative New England mills, where the magnitude of some apparently insignificant duties has been brought home to him, the writer would unreservedly accord the doffing of twisters a place among the important operations in a twisting department. For the purpose of preventing any interruption to the productive capacity of the machinery, it should be done, whenever possible, while the twisters are running. This can be readily accomplished on those twisters which have individual spools, or cones, in the creel for each spindle, and are equipped with the warp builder-motion, making a straight, or taper-top bobbin—in short, that class of twisters used in making ply-yarns, thread and so on.

To facilitate this method of doffing, it is necessary to have the empty bobbins in such a position that each one is instantly available. Metallic or wooden boards, fitted with pegs or pins, to retain the bobbins in place are very appropriate in this connection. Fig. 1a, shows a side view of such an empty board, while Fig. 1b, illustrates the full bobbins on the same board. The boards

Fig 1a

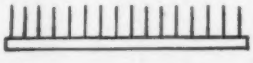


Fig 1b

should be of a convenient size for handling. For example, on a 160-spindle twister, 1½ inch rings, there would be five bobbins in a row widthwise, and sixteen, lengthwise, on the boards. Obviously, this would mean a board for each side. The size of the boards, however, and also the number of bobbins per board, can best be determined by the individual needs of each room. It would be well, wherever possible, to have some uniform standard.

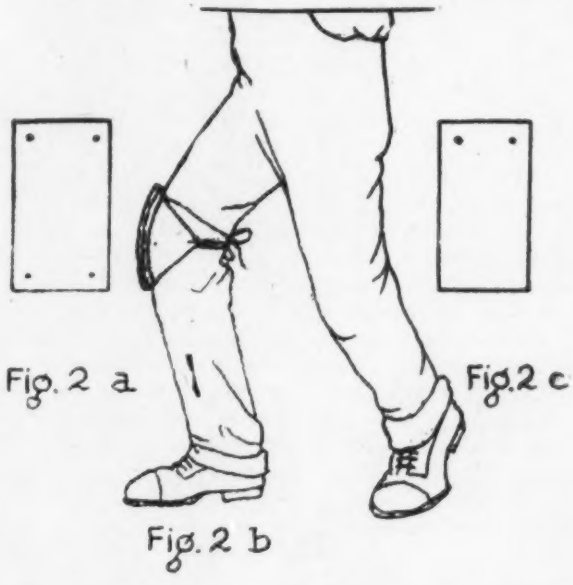
Equipment of Doffers.

Trucks for holding the boards should be provided. These trucks can be of the compartment type; the compartments, one above the other, being so constructed as to permit the use of the trucks in very narrow alleys. Each truck should be provided with a footrest to serve as a support for the right foot; for the reason that the action of the right leg, bending at the knee to stop the spindles, would cause the foot to leave the floor at each spindle. The footrest is also used as a means of pushing the truck along from spindle to spindle, leaving the hands free to do the doffing. Another attachment to the truck must be considered; this is a holder for the knife that each doffer uses. Such an arrange ment will eliminate some rather serious accidents that are bound to occur when doffers carry open knives in their pockets.

To have uniformity in regard to knives is often advantageous; it will eliminate the potato-peelers, and also the expensive affairs which are a constant temptation to the cupidity of some doffers. The latter, furthermore, should never be permitted to work minus a knife; for they have a bad habit, when without one, of cutting a lap on the bottom-roll by striking it with the edge of a top-roll—an act clearly detrimental to both rolls.

Because it is not required on twisters whose spindles are fitted with knee-brakes, the knee-protector as a part of a doffer's equipment is mentioned last. A good protector can be made of canvas, or leather,—leather preferably—three by five inches in size, with a hole punched at each corner for the fastening band.

Figure 2a, gives an idea of the knee-protector, and Fig. 2b, the method of its attachment. Sometimes only the upper corners are perforated, Fig. 2c, the lower end



in this case hanging loosely. The four-hole method, however, is the one in greatest vogue for both male twister-tenders, and doffers, because the appliance can be more firmly affixed to the knee.

Doffing Operation in Detail.

An endeavor will now be made to show as clearly as possible the operation of doffing a twister while the machine is running. The truck is set in position alongside the twister, and the doffer places his right foot on the rest-board. The next three movements are performed simultaneously: as the right knee presses against and stops the spindle, the left hand grasps and removes a full bobbin from the spindle, leaving, of course, the end of yarn hooked to the traveler; the right hand picks up an empty bobbin from the board. Holding the continually lengthening end taut with the left hand, a circular motion—the direction of which depends on whether right or left twist is being inserted at the twister—is made with the empty bobbin about the end of yarn. This action causes the end to be wound or lapped about the bobbin. Assuming that the spindles are rotating in the direction of the hands of a clock, as one looks down at the rings, the movement

would follow the path indicated by the arrows in Fig. 3.

With the full bobbin still in the left hand, a finger on this hand, usually the index, is used to draw out the elongating end, and the empty bobbin with the lapped end is pushed on the spindle which is stopped for this purpose. Immediately, now, the spindle is released, together with the end held by the left hand—these last two operations are done at the same time. In letting the end go, it is customary to take into consideration the ease with which the traveler will start. If the rings are in good condition,

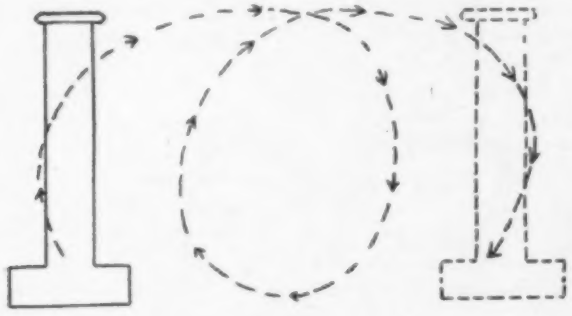


FIG. 3

well-burnished, fairly clean and properly lubricated, no trouble, usually, is experienced in getting the traveler started, and the end can be released from the position shown at (X) Fig. 4a. In case the travelers do not slip easily, the end may be lifted to the point (Y) at Fig. 4b, and, if necessary, a gentle but persistent poking of the traveler with the point of the right index finger resorted to. A condition of the rings or travelers, however, that necessitates this practice should be remedied as soon as possible; for the efficiency of the doffers is impaired by

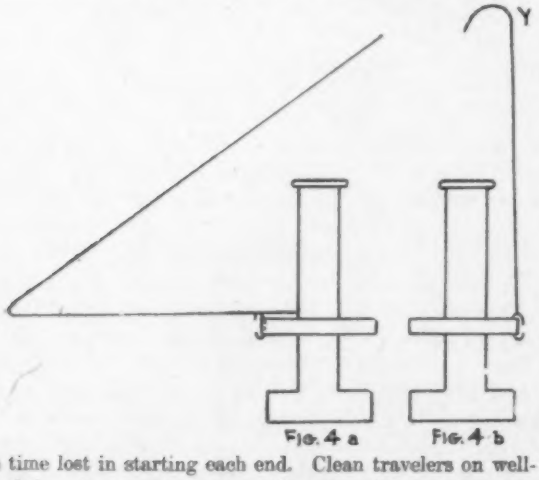


FIG. 4 a FIG. 4 b

the time lost in starting each end. Clean travelers on well-cared-for rings will start readily regardless of how the end is held, or from what point released.

As soon as the end is started, the full bobbin is transferred from the left hand to the right hand. At the consummation of this movement, the cycle starts over again; for just as soon as the left hand is free from its burden, it immediately grasps the next full bobbin. At the same time, the right hand drops the full bobbin into its proper place on the board, and picks up the next empty bobbin.

The cycle of movements just mentioned can, perhaps, be more graphically depicted by means of the tablet, Fig. 5. At I, three distinctly separate acts—1, 2, 3—are grouped together, because they are performed coincidentally. This simultaneousness of action is again indicated at II; whereas III, and IV, though tabulated separately, to give them greater emphasis, are often performed so closely together by a skilful doffer that they seem done at the same instant.

FIGURE 5.

I.	1. Stop spindle
	2. Grasp full bobbin with left hand
	3. Grasp empty bobbin with right hand
II.	1. Wind yarn on empty bobbin
	2. Draw back end with forefinger of left hand
III.	Push empty bobbin to place on spindle
IV.	Release end and spindle
V.	Transfer full bobbin and start cycle over again.

Teaching Doffers.

Care should be taken that doffers are taught to pick the empty bobbins from the board in a systematic manner—not move about the board in a hop-skip-and-a-jump fashion. The better plan is to start at the corner nearest the doffer and the twister, and then proceed along this row half its length, coming back on the second row, and thus completing the remaining rows. When the half board nearest the doffer is filled, the board should be reversed and the same procedure gone through. Occasionally, a long-armed doffer can cover all the bobbins on a board without turning it.

When the winding action 1, of II, Fig. 5, is in the direction shown by Fig. 3, the bobbin is moved in the one indicated direction only. Expert doffers, on the First Twisters, can wind the end of yarn around the bobbin with but one circling movement. At the Finishing Twisters, however, where the rotation of the spindles is opposite that of the First Twisters, it is sometimes customary to supplement the first winding movement with a second one, in the opposite direction. The idea, primarily, is to fasten the end on the bobbin so that no tail will stick out to become entangled with and cause a breakage of the neighboring ends. For simplicity of movement, however, and also for the gain in time, it is advisable to teach doffers to wind in one direction only, whether doffing on First or Finishing Twisters. And to prevent the objectionable tail from flaring out, the end should be lapped on the bobbin just ahead of the point where the ring-rail traverse will start winding when the bobbin is placed in position. For example, if the rail-traverse is going down, the end should be lapped on at (X) Fig. 6a; if on its upward passage, at the point (Y) Fig. 6b. In this way, the yarn wound on the bobbin during the normal course of action of the rail-traverse will cover and bind the projecting tail.

Another feature that has a decided influence on speed in doffing is that of swaying the body back and forth. A bobbin can be doffed no faster than the time required for the body to swing backward and forward; therefore, this reprehensible practice acts as a retardant to the

speed at which a bobbin can be doffed. It is a time-waster and should be avoided. The greatest speed attainable in doffing is accomplished by the least movement of the body outside that required in progressing from spindle to spindle. Elimination of all unnecessary motion—this is the ideal toward which all doffers should strive. Especial pains should be taken to see that the doffer-learners are taught the proper way of doing the work; for, as in every class of work, the unlearning of incorrect teaching is decidedly hard.

Sometimes one is confronted with the problem of whether or not to permit "punching"—to use a New England colloqualism. This is a method of doffing by lapping the end of yarn one turn around the spindle blade (Fig. 7), then pushing the bobbin over the spindle and end, and breaking the latter as the bobbin is pressed home. This mode of doffing is a quick one, and easier to learn than the other. It has, nevertheless, one serious fault. If the ring-rail is at the upper part of its journey, at the time the bobbin is punched, there is certain to be a long end of yarn, often eight or ten inches, hanging to the bottom of the bobbin (Fig. 8). This long end may cause breakages by whipping the neighboring

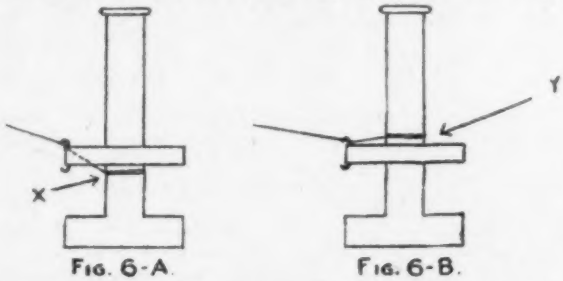


FIG. 6-A. FIG. 6-B.

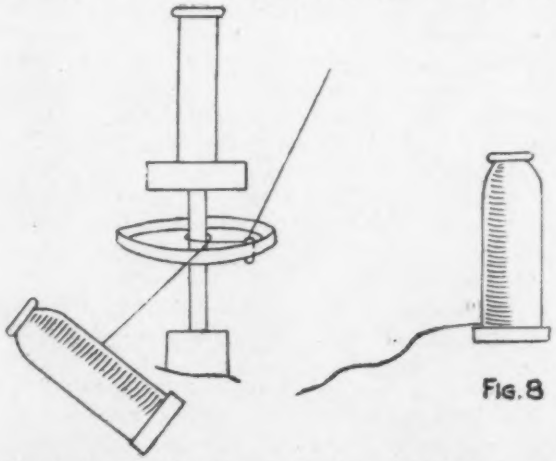


FIG. 8

ends, or it will catch these ends when the bobbin is removed from the spindle. The long end on the First Twister bobbins, furthermore, may cause trouble at the subsequent process of winding, on account of the possibility of its lapping around the bobbin and thus entangling the running end. Again at the Finishing Twister, particularly during the removal of the bobbin from the spindle, the long trailer may become twisted-in with one of the adjacent ends, with the result that in the effort to quickly withdraw it, a short section—one to three inches—may be broken off and become incorporated in the other or running end. But, at any rate, as a means of keeping a room from "busting up," as an expedient to tide over a temporary shortage in the doffing personnel, this method of doffing is useful.

Some Rulings.

One question which, if not decisively settled, will always give rise to more or less heated arguments between doffers and twister-tenders, is: who should replenish the spools on a frame that is doffing? The answer is to insist that the twister-tender attend to the entire creeling, regardless of whether the machine is doffing or not. Another oft-disputed point—the piecing of broken ends—may be amicably regulated by making the twister-tender responsible for the piecing of all ends on the frame until the doffer starts doffing, and then having the doffer look after any that break while he is working at the twister.

The fact to be borne in mind by all parties immediately concerned—section-hands, doffers, and twister-tenders—is that the ends must be kept running. Doffers, particularly, often develop a bad habit of leaving down the ends that they break until they finish doffing the twister, expecting, of course, that the twister-tender might piece them up. This habit, on account of the attendant loss in production due to the spindles being stopped, should be avoided; or, if already acquired, broken off as soon as possible.

While considering the avoidance of stoppages, it may be said that when, from any cause, the bobbins become so big before the doffer can get around to the machine, that the piecing of certain ruptured ends by the twister-

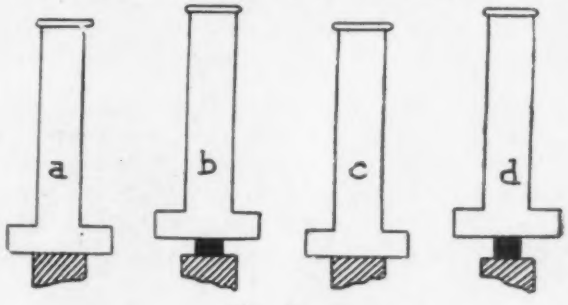


FIG. 9

tender would only result in further breakages of these same ends, and the possibility of lashing down others with them, then the section-hand (or head-doffer, if there is one) should put a board of empty bobbins on the machine so that the twister-tender can piece on these, eliminating the repeated breakages.

Eternal vigilance, that well-worn phrase is absolutely essential in the matter of making doffers place their bobbins properly on the spindles. Nothing, perhaps, is more annoying than bobbins "left up" on the spindles. In Fig. 9, (a) and (c) denote bobbins accurately located; (b) and (d), illustrate bobbins in faulty position. Bobbins set like the latter will be filled over on the bottom, becoming tangled, and requiring some one to fix them. Furthermore, the fixing of tangled bobbins means an increase in the waste of the room. A good ruling is to insist that just as soon as a doffer completes one side, he must look over the bobbins on that side and push down those that may be sticking up. The same practice should be followed on the second side.

Schedules.

It is essential for the good running of the room, that

the twisters be doffed systematically; otherwise, the bobbins may be doffed too small at one time, and allowed to get too full at another period. Small bobbins will cause dissension among the workers at the subsequent process of winding. On the other hand, bobbins too full often run over the bottom and become tangled; or, on account of rubbing against the rings, the loose ends of yarn may be hard to find. .....

Now in order to guard against these undersirable features, a schedule should be made up, showing the doffing periods of every twister. Where the section-hand has the time it is sometimes advantageous to have a daily schedule attached to each machine. This system is especially adaptable when twisters run day and night, with the constant possibility of a cut-and-dried schedule being dis-

FIG. 11

MON.	7-30	1-
TUES	7-30	1-
WED	7-30	1-
THURS.	7-30	1-
FRI.	7-30	1-
SAT.	7-30	

arranged. However, if there is no night work, and it is still desired to have the schedule attached to each twister, the form in Fig. 11 may be used. This will take in a whole week, and consequently need only be made up once in that interval of time.

Fig. 12 shows a form of schedule that takes in a whole section. Once made up it will give the doffing time without any further attention excepting where the regular

XX YARN	RUNNING TIME 4 H.-20M.		
MON.	7.30 1.00	9.00 3.30	
TUE.	7.30 1.00	9.00 3.30	
WED.	7.30 1.00	9.00 3.30	
THUR.	7.30 1.00	9.00 3.30	
FRI.	7.30 1.00	9.00 3.30	
SAT.	7.30	9.00	
	1-2-3	4-5-6	
	7-8-9	10-11-12	

FIG. 12

working time is broken by holidays, and so on. To facilitate understanding the method of making up the schedule only one number of yarn will be taken for an example. Obviously, the greater the diversity of counts, and their accompanying varied periods of doffing, the greater the need of arranging the doffing in a systematic manner. So that where the schedule system is of distinct benefit even with only one or two numbers of yarn, its advantages increase with the variety of counts. Let it, then, be assumed that the 48 hour week is made up of five days of 8¾ hours, starting at 7:30 in the morning and stopping at 5:15 in the afternoon, with an hour, 12 to 1, for dinner. On Saturday, the time would be 4¼ hours, from 7:30 to 11:45. Starting at 7:30 Monday morning, it will be noted that the doffing is pretty evenly divided for the day, and also

MON	TUE	WED	THUR	FRI	SAT
7.30	7.30	7.30	7.30	7.30	7.30
7.45	7.45	7.45	7.45	7.45	7.4
8.00	8.00	8.00	8.00	8.00	
8.15	8.15	8.15	8.15	8	
8.30	8.30	8.30	8.30	.45	
8.45	8.45	8.45	8.45	2. 00	
9.00	9.00	9.00	9.00	2. 15	
9.15	9.15	9.15	9.	2. 30	
9.30	9.30	9.30	9 .5	2. 45	
9.45	9.45	9.45	.00	3. 00	
10.00	10.00	10	3. 15	3. 15	
10.15	10	3.30	3.30	3.30	
10.30	3.45	3.45	3.45	3.45	
10.45	4.00	4.00	4.00	4.00	
11.	4.15	4.15	4.15	4.15	
3.30	4.30	4.30	4.30	4.30	
4.45	4.45	4.45	4.45	4.45	
5.00	5.00	5.00	5.00	5.00	

FIG. 13

for the week. The doffing period is 4 hours and 20 minutes, but for convenience in doffing it is made 4½ hours, mornings, and 4¼ hours, afternoons. It will be readily seen that the same machines that are doffed at 7.30 will be doffed again at 1 o'clock, and therefore these two time-periods are grouped together.

To this schedule may be appended the numbers of the twisters under their respective time columns so that anyone consulting the table can readily determine at what time each machine doffs.

An important item in figuring out schedules is to avoid, as much as possible, having the twisters doff too near stopping time, either noon or night. The reason is that if the yarn is weak, or the rings not in the best of condition, there may be excessive breakages at starting again, due to the greater traveler pull when the bobbins are small.

When doffs do not come in evenly every week, they can usually be arranged to doff in a two, three, or four week's rotation. It is advisable to limit this rotation period to four weeks; otherwise, the doffing schedule will be too cumbersome. In the case of a broken week, as for instance, on account of a holiday, a special schedule should be made up; and it should be so arranged that the twisters can be run under or over their usual time, in order to bring them into the regular schedule as soon as possible after the passing of the holiday.

For the convenience of the person who makes up the doffing schedules, the table in Fig. 13 will, it is believed,

be of practical value. As seen, it gives the time-period of a 48 hour week, divided into sections of 15 minutes each, starting at 7:30, Monday morning, and ending at 11:45 Saturday noon. Its use will be illustrated by an example. Suppose that a twister will fill in 4½ hours. Instead of starting, as one naturally would without the table, at 7:30 Monday morning, and laboriously figuring where four and one-half hours will fall from there, and so on to the succeeding periods, one simply marks down 7:30 on a sheet of paper ruled as the form of Fig. 12. Next, one counts eighteen of the fifteen minute periods (equivalent to 4½ hours) which brings us to 1 o'clock; from there one proceeds to the next 18th period, progressing, in this way, along the table from Monday to Saturday, and filling in the week's doffing. It may be well to say that it is sometimes necessary to add or deduct a little from the time thus found, in order to have the doffing more conveniently done. But this, however, is one of those matters which had better be left to the discretion of those who have the immediate supervision of the twisters. Every system works best when it is of an elastic nature—easily back again, in proper working condition, after a session of unusual stress. To prevent confusion, the noon-periods are left off the table, the time-sections passing from 11:45 to 1, and then on.

Running Time of Twisters.

On account of its importance in the making up of an efficient doffing schedule, the matter of the proper running time of the twisters will be dealt with. Of course, this will depend, to some extent, on the conditions prevailing in any particular room. If the supervising corps—section-hands, head-doffers—is such that these persons can give liberally of their time and attention to the careful carrying-out of schedules, the twister-bobbins can be filled almost to the limit. On the other hand, doffers of poor capability, or lack of constant oversight will make it advisable to allow a certain leeway, say from 15 to 30 minutes under the possible running limit, depending, of course, on the circumstances, and the counts on the twisters. As a matter of fact, it is a safety-first measure, in any case, to fix the running time so that in emergencies the frames can be run somewhat over the allotted time without incurring the risk of the inevitable mess that an overfilled frame always occasions.

Helping Doffers.

It is an excellent plan to have one or more of the lower-paid workers learning to doff, on each section, so that a vacancy among the doffers can be filled without causing a disruption in the doffing schedule. But care must be exercised that workers, either learners or others, who help a doffer do it in such a way that the doffer will not be embarrassed in subsequent doffings. To make this point clear: let us assume that a doffer starts ordinarily—and it should be distinctly settled as to which end and side of the machine, a doffer should always start—at (a) Fig. 14, and doffs to (b), then goes to the other side, starting here at (c) and finishing at (d). Suppose, now, that some other worker starts doffing at (d) at the same time that the doffer is beginning at (a). Obviously, the next time the doffer works on the frame alone, the bobbins, so doffed at (d) by another worker, will have to run over 15 or 30 minutes, acording to the number of spindles on the twister. No need to say that the bobbins thus run over may be rubbed against the rings, perhaps tangled, and often will jump on the spindles, making slack work, and eventually will fall on the floor. It would be better, in view of these facts, to have the learner, or other person, start on the same side as the doffer, and near him.

Another point to keep tabs on is where a doffer, whose own twisters are all doffed, helps out a fellow-doffer. He will usually start on a different machine from that being doffed by the regular doffer. In this case, as one readily perceives, both frames will be doffed at the same time. Now if both are running the same counts, it is obvious that the twister, ordinarily the second one doffed will, by reason of having been simultaneously doffed with the

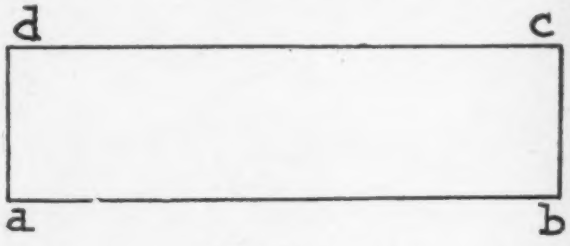


FIG. 14.

first one, have to run over 15 or 30 minutes the next time the doffer has to doff his machines alone. The result is usually a "busted" or "smashed" frame, with its overfilled bobbins, broken ends, and strained tempers.

It sometimes happens where a doffer has several counts on his frames that two twisters will be ready to doff at the same moment. To doff one at the prescribed schedule time and let the other wait would be to invite disaster for the waiting twister. If help is plentiful, a spare doffer could take care of one of the machines. The better plan, however, is to have the coarser count doffed about 15 minutes before the other. This latter, if a short twister, will be started on its regular schedule time; if a long one, it will only run over a quarter-hour. In this way, no assistance is required by the doffer, and he will not look forward to help whenever he has a combination like that just noted.

Alternate Doffing of Twisters.

There is another feature that requires careful consideration. It is that the twisters to be doffed should be so arranged on the schedule that the doffing will then be distributed throughout the day. The doffing will then be done in a thoroughly efficacious manner with little or no breakage of ends. Group-doffings of twisters which concentrate the burden of doffing in a short interval of time, thereby creating a long stretch of time with no doffing, should be avoided. Such a procedure, unless extremely well-looked after, will bring chaos to any twisting room. Far more efficient is the uniformly apportioned plan of doffing.

Where one doffer takes care of the frames of two or more twister tenders, the same principle of uniformity in doffing should be applied. By attention to this point, none of the twister-tenders will have all her machines doffed in close succession. Such an occurrence, with its evil effects on the good running of the set, would ensue, if care were not exercised. A glance at Fig. 15 will make the point clear. Assume that the two sets, A and B, operated

by two different twister-tenders are doffed by one doffer. For simplicity, all the twisters are presumed to have the same counts, and each doffing, say, once a day. The proper procedure would be to doff first, No. 1 in set A; then No. 7 in set B, alternating in this fashion until one-half the frames in each set had been doffed in the forenoon, and the remainder in the afternoon. Neither

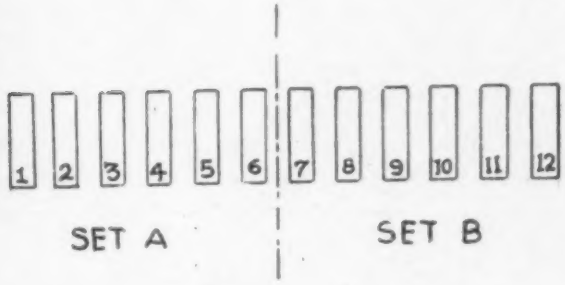


Fig 15

twister-tender, then, will have all of her machines doffed in close sequence; rather, they are doffed in consecutive-alternate uniformity throughout the day, allowing her ample time to give them proper attention between the doffs.

Standard Time for Doffing.

If the doffers are required to do other work besides doffing, cleaning, for instance, it may be advisable to doff the machines that will fill in each half-day in close succession immediately at the starting of the machinery, so that the time between termination of the doffing and the cessation of the working period can be utilized for the cleaning duties. This disposition of the doffing, on account of its potentiality for a general mix-up, must necessarily be left largely to the discretion of the men who have immediate charge of the sections—second-hands and section-hands. The training of these men, accordingly, should include a thorough knowledge of the possibilities and limitations of a judicious manipulation of the doffing schedules—a very important undertaking.

Incapable doffers, and frequently indifferent doffers, who taking advantage of the shortage of workers will kill as much time as possible, will string out the doffing time so that little other work is done by them.

A standard of time, therefore, in which it is desired to have each twister doffed should be established to correct this condition. It can be readily determined by taking the average time of the medium and best doffers. Care, of course, should be exercised that this time is not so small that only the very best workers can accomplish it. Such a procedure would naturally only tend toward driving out those doffers whom the section-hands would have to get after for not doffing speedily enough.

Regarding the Supply of Doffers.

Once the standard has been set, endeavors should be made to have the doffing done in accordance with it. Bearing this objective—doffing in standard time—in mind, a section-hand should always have one learner ready, so that when a vacancy occurs—either through voluntary separation, or discharge—it can be immediately filled.

Lack of attention to this latter point will in this day of frequent labor turn-over—separations from work, as the Monthly Labor Review terms it—necessitate the rehiring of former doffers. Such persons, it will be generally admitted, having worked elsewhere, are usually not so tractable as the employees in the room who have never worked in other places. The chances, too, are that these former doffers have come back simply to tide over a period of financial embarrassment while they wait for something better to turn up. As soon as this opportunity presents itself, they flit, and for want of experienced doffers to take their places, schedules, standard doffing-time, and so on, go to crash, like an aeroplane with its engine gone dead. Logically, therefore, the scientific management way of making such an undersirable contingency a remote factor, would be to train the lower-paid workers in the room to become doffers, hiring in doffers from outside only when absolutely compelled to, and then only those who have a good record.

Cure for Soldiering.

Soldiering, or loafing on the job, is a natural constituent in the make-up of some doffers. A good cure for this complaint is to have a system something like this: dismiss the doffers 15 or 30 minutes earlier each day than the regular working hours that they are paid for. For instance, take the starting time as 7:30, the day 8¾ hours, and the stopping time as 5:15. Now, under the disciplinary plan, if it may be thus termed, the doffers are permitted to cease work at 4:45 or 5 o'clock—providing, of course, that their doffing is all done.

Say, now, that one of the doffers, considered a competent worker but just a little lazy or indifferent occasionally, should loaf too long on his frames. The bonus time in his case would be withdrawn, and he would be compelled to finish out the full day. This punishment is similar to that of keeping children after school. Very few boys fail to yield to its disciplinary effect—most of them are eager to leave work early, and are pretty sore if they can't get out. Of course, as with everything else, there are exceptions; and the best advice in regard to these incorrigibles is to eliminate them at the first favorable opportunity.

A basis on which to compute the time required to doff a twister on medium or fine counts would be about 50 bobbins per 5 minutes. As a matter of fact, however, a few minutes spent in timing the doffing will be the best guide for each individual room.

Standing-Pay or Piece-Work.

Whether to pay standing-pay or piece-rates will depend a good deal upon the other duties that it is desired to have the doffers do. If they are required to assist in cleaning the twisters, and if they have to clean during the noon-day stoppage, then perhaps it is more economical to pay them standing pay. If, however, they doff only, a piece-rate system may be introduced, based, let us say, on so much per twister, using the above-mentioned 50 bobbins per 5 minutes as a standard to set the rate.

The importance of doffing, it is believed, will be acknowledged by everyone who has read thus far. While originally intended to be but a rather brief summarization of doffing, the article, to give vividness to some of the more significant features of the operation has been greatly expanded; nevertheless, the writer cheerfully concedes that

much more could be said without exhausting the subject. The minor, but inevitable, accessory duties of the doffers, such as taking away the full boards, getting empty ones, winding-up the ring-rail-traverse rack (for taper-top bobbins), cleaning their trucks, keeping their knives sharp, starting promptly on time, and others that could be enumerated—these have not been gone into, because they are best taken care of by those who directly supervise the doffers, and in their own way.

"Felco" Brushes in New Home.

The Atlanta Brush Company, Atlanta, Ga., a newly-organized corporation, with T. C. Perkins president and treasurer, has purchased the assets, business and good-will of the D. D. Felton Brush Company, Atlanta, manufacturers of the well known "Felco" line of brushes. The plant has been moved from Edgewood Ave. & Boulevard, Atlanta, to Central Avenue and Trinity Avenue, where the company has resumed operations in larger and more commodious quarters. The same efficient operating organization will be maintained, it is announced. This company will continue the manufacture of textile mill brushes under the well known "Felco" trademark.

T. C. Perkins.

Mr. Perkins, the president and treasurer of the new company, has been a resident of Atlanta for many years, and is secretary and treasurer of the Trio Laundry Company of that place. He anticipates being at the Fourth Southern Textile Exposition at Greenville to get better acquainted with the mill men, with whom he will be more intimately associated in connection with his new company.

E. I. du Pont de Nemours & Company, Wilmington, Del., distributed for the first time at the recent Chemical Show in New York their new "Dyestuff Intermediates" booklet, copies of which may doubtless be had upon application by those interested.

The Early English Cotton Industry.

This is the title of a book by George W. Daniels, M. A., senior lecturer in economics in the University of Manchester, England. It is illustrated with five views and contains 214 pages. This book is the result of exhaustive researches made by the author and is a very comprehensive study of conditions in the early cotton industry of England. Much of the material used in its preparation was found in the business material of the firm of M'Connel & Kennedy. The large part of the book is centered mainly in the development of the English cotton industry from its beginning to about the end of the third decade of the nineteenth century. It tells of the beginning of cotton manufacturing in Europe, the medieval guilds in the textile trades, of the development of cotton manufacturing, the coming of machinery from the "flying shuttle" invented by John Kay in 1733 to the "carding" patent taken out by Arkwright in 1775. It goes on to deal with the industrial chaos caused by the Seven Years' War. A chapter is devoted to the invention of the "mule" by Samuel Crompton in 1779 and the rise of a new cotton manufacturing industry, dealing with various improvements made on Crompton's invention and its relation to the growth of the industry, and with the transition caused by the improved "mule." The latter part of the book is given over to a recitation of the affairs of Crompton and to the reproduction of some of his letters, hitherto unpublished, which were found in the material of the firm previously referred to.

This book is published by Longmans, Green & Co., whose American office is at Fourth Avenue & 30th St., New York. A copy may be secured for $3.25, either through Cotton or direct from the publishers.

Painting Contractors on a Large Scale.

D. R. Hall, who has been the factory representative of the Patton Paint Company, a subsidiary of the Pittsburgh Plate Glass Company, for the past ten years, has now become connected with the H. Newton Marshall Company, contracting painters of Boston, Mass., as Atlanta manager. Mr. Hall has opened an office at 301 Trust Company of Georgia Building and will manage the southern business for the H. Newton Marshall Company, whose principal line is painting cotton mills and large industrial plants.

H. Newton Marshall, the President of the company, is not a stranger in the South, particularly in the mill districts, where he has been contracting for painting for a number of years. He now finds that his business has grown to such an extent that he requires an Atlanta branch to handle the southern business. In this connection, his choice of Mr. Hall, with his wide experience and thorough knowledge in the manufacture of paints, as well as having at one time been in the contracting paint business, is, we feel sure, particularly fortunate.

Mr. Hall advises that he has every equipment for doing this class of work so that it does not interfere in any way with the operation of the mills.

An easy way to make money is to stop losing it. Are you watching the little things?

GREENVILLE—The

Greenville is growing. We have emphasized this fact upon two previous occasions when it has been our pleasure to prepare descriptive stories about this thriving city. In those stories we pointed out several reasons why Greenville should and did achieve prominence as a textile center and in this article we are reproducing the illustrated heading used on our story of three years ago in order to point with still greater emphasis to one of the features that is materially aiding in promoting a greater Greenville—the Textile Exposition.

It is useless at this time to go into any details relating to the history of the Southern Textile Exposition. This history is too recent and the details are too well known to need repetition here. It is sufficient to say that while Greenville people took the lead in establishing a permanent Textile Exposition in the South, they builded, far better than many of them realized at the time, toward the final and ultimate end of a greater Greenville.

In 1917, one hundred and forty-one years after Richard Paris established his trading post with the Cherokee Indians, near the falls of the Reedy River, we found a city of 43,000 people disposing of mill products annually to the amount of $12,000,000 and paying out in payrolls for the support of its citizens the sum of $9,500,000. The last three years has shown a net growth in Greenville's population of 4,000 making, according to the last census a total of 47,000 people. A very much larger financial growth is shown in that the annual value of mill products today is thirty million dollars, while Greenville's textile payrolls have grown to fourteen and a half million dollars.

The Southern Textile Exposition, which this month opens its doors for the fourth time, has been the means of bringing to the city of Greenville a great many influential people from all sections of the country, many of them men who had never before heard of Greenville as a manufacturing center in any more than an incidental way, and it is undoubtedly true that the interest thus aroused has been an important factor in promoting Greenville's growth. It is impossible for a stranger to visit Greenville with its wonderful location at the foot of the Blue Ridge mountains, a thousand feet above sea level, with its 80 miles of paved sidewalks, its 25 miles of paved streets, its excellent street car system, its motorized fire department, its 60 miles of sanitary sewers and its supply of pure spring water from the top of Paris Mountain, without at once realizing its possibilities from an industrial standpoint.

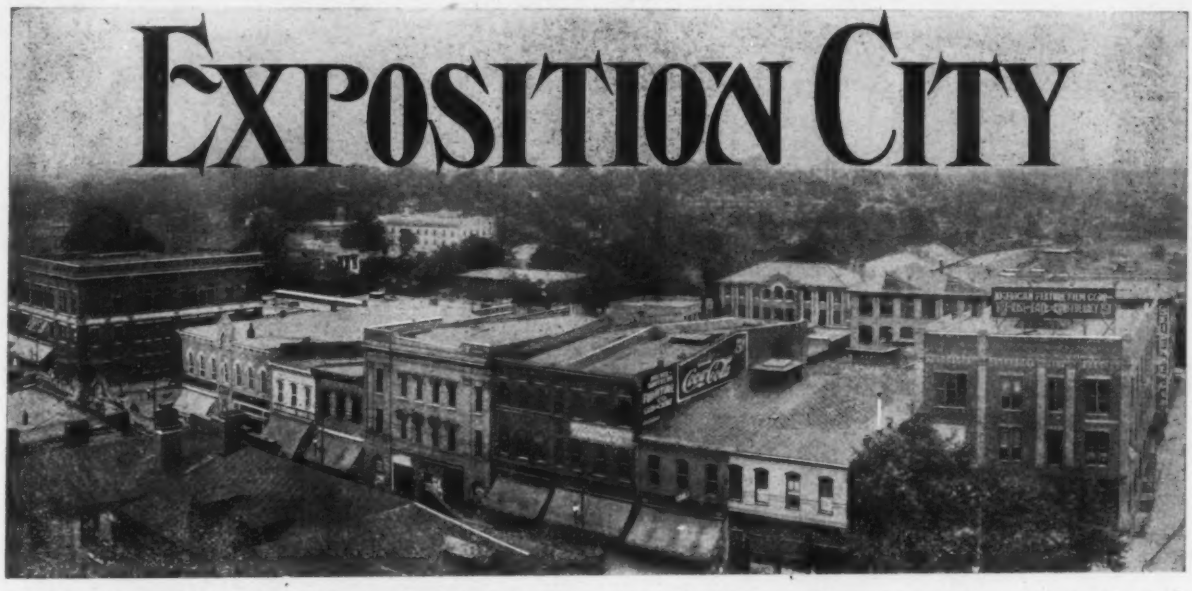
Among its other interesting features for the industrial stranger Greenville presents its five colleges, its twenty-two cotton mills, its fifty-six churches, its eleven banks, its two building and loan associations, its five railroads with seventy passenger trains daily, giving access to and from that wonderful Piedmont section of the Carolinas of which it forms the center. It is also of interest to note that its textile mills house 961,012 spindles and 22,804 looms and that the value of its textile investments amounts in round numbers to $100,000,000.

Fifty-six mill presidents make their homes in Greenville and cotton mill machinery, supplies and equipment for eighty-three southern mills are bought by purchasing agents located within its environment. In 1917 the annual value of such purchases was in round numbers $5,000,000, while in 1920 this annual value of purchases had reached the immense sum of $8,000,000 or a growth of $1,000,000 a year for the past three years.

In order to bring to Greenville the necessary products and supplies for its twenty-two mills and their inter-related demands the five railroads which serve the city utilized during the past year 33,983 cars, while the $30,000,000 of mill products shipped out amounted to 28,847 carloads of material. The annual payroll of the railroad employees of the Greenville division amounts to $2,486,355, while the annual freight receipts for handling this traffic have grown from three and a half million dollars in 1917 to over four and a quarter million dollars in 1920, and it should be noted in this connection that this latter figure is not based upon the recently increased freight rates which went into effect a month or so ago.

Greenville is the distributing center for upper South Carolina, and is the home of fifty wholesale houses while twenty-five national firms maintain branch offices at that

EXPOSITION CITY



point. Viewed purely from a textile standpoint there are located in the city of Greenville thirty-eight southern representatives or manufacturers' agents who do not only look after the local business but who also travel the rich territory surrounding Greenville on all sides.

The great growth in textile manufacturing in this section has demanded more and larger amounts of power since those early days when the Reedy River furnished the motive power for Greenville's early manufacturing establishments. This power has been furnished through two sources, individual steam power plants located at the mills and operated on coal brought in over the Southern Railway and the Carolina, Clinchfield and Ohio Railway; and some 225,000 horse power of electric current secured from the long distance transmission lines of the Southern Power Company and its subsidiaries who have converted the many water powers of the Piedmont section into electrical energy and transmitted it to convenient points.

Past achievements have marked Greenville as a city of destiny. Present developments assure this city of a place in the front rank of cities in the section of the United States in which it is located. Construction work has been started upon a new 17story office building, which, when it is completed, will be the tallest building in the state of South Carolina. Included in the other development work in Greenville are the improvements and expansions which are being made by half a dozen mills there, which will amount to more than one million dollars. A quarter million dollars is being expended for a new hospital and another quarter million for the erection of a new high school building. Nearly $200,000 is being expended at Furman University, one of Greenville's several colleges. A million dollar automobile company is erecting a plant in Greenville, another automobile firm is to erect a large plant there and a company for the manufacture of folding ladders has recently been organized.

In the last eighteen months Cagle Park, a fashionable residential district of Greenville, which two years ago was practically deserted, has been filled with beautiful homes. A new country club, with 18 hole golf course, is being constructed and 500 homes are in course of erection in that section.

Greenville is growing. We wish to reiterate this fact at this point because right here we wish to introduce some further evidence of that growth through the actual statements of its banking institutions. For a city so rich in business as the foregoing figures and facts have indicated it is absolutely necessary that the financial intitutions shall be solvent and their managements active. We are reproducing the comparative statements of nine Greenville banks, in one instance at the close of business September 11, 1917, and in the other instance at the close of business on June 30, 1920. From this it will be noted that the total deposits have grown from six million dollars to fourteen million dollars while the total resources have increased from nine million dollars to nearly twenty-one million dollars.

Bank Statements at Close of Business September 11, 1917.

NAME OF BANK	Capital	Surplus & Undivided Profits	Deposits	Total Resources	Year Organized	Stock Value
American Bank	$ 75,000	$ 55,206	$ 489,353	$ 729,560	1890	135
Bank of Commerce	100,000	25,197	501,464	658,428	1906	120
City National Bank	100,000	51,093	595,913	785,598	1895	150
Farmers & Merchants Bk.	50,000	14,248	458 860	543,108	1907	124
First National Bank	100,000	123,206	885,089	1,226,576	1872	250
Fourth National Bank	100,000	36,179	720,619	961,789	1908	125
Norwood National Bank	125,000	259,758	1,377,940	1,920 299	1907	300
Peoples Nat'l Bank	200,000	149,462	1,075,317	1,450,379	1887	165
Piedmont Sav. & Trust Co.	50,000	15,346	748,228	813,575	1916	
Total	$900,000	$729,694	$6,762,783	$9,089,322		

Bank Statements at Close of Business June 30, 1920.

NAME OF BANK	Capital	Surplus & Undivided Profits	Deposits	Total Resources	Year Organized	Stock Value
American Bank	$ 75,000	$ 73,408	$ 1,095,780	$ 1,365 827	1890	165
Bank of Commerce	300,000	177 512	1,288 042	2,234,575	1906	175
Citizens Trust Co.	100,000	13,204	188,931	388,736	1918	135
Farmers & Merchants Bk.	50 000	57,473	1,567,114	1,709,589	19 7	200
First National Bank	100,000	167,628	1,9 5,048	2,324,177	1872	310
Norwood National Bk.	500.00	912.710	3 716,362	6,759.4 8	1907	310
Peoples National Bank	200,000	267,989	2,378,198	3,008,070	1887	240
Piedmont Sav. & Trust Co.	50 000	32 137	1,283,700	1 376,479	1916	...
Woodside National Bank	200,000	25,868	1,230,533	1,616,098	1919	156
Totals	$1,575,000	$1,727,929	$14,674,6 8	$20,783,219		

What the Textile South Gains through the Southern Textile Exposition

By William G Sirrine

The Southern Textile Exposition has become an established institution. Its biennial session of one week is looked forward to with growing interest, not only by southern mills but the textile industry all over the United States. It is here that the manufacturer has an opportunity to see all the latest machinery and all the most improved devices for converting the raw material into finished product with the least expenditure of labor and time. It is here that he meets the men who furnish the trade with the machines, the equipment and the supplies. It is here that personal acquaintances are kept up and discussion of manufacturing problems takes place, leading to a better understanding of what the seller has to sell and of how it should be used, and laying the foundation for friendly adjustments should buyer and seller have misunderstandings.

In the past few years the foremen and the heads of various sections have come into a larger sphere of usefulness. They have come to better understanding with the superintendents and the executives, until today the present cotton mill organization is like the arrangement in battle formation: the colonel representing the executive, the lieutenant-colonel the superintendent, and so on down through the ranks of major, captain and lieutenant to the beginner in the ranks who wears the uniform of the private. And like the private in the ranks, of whom Napoleon said every one may have the baton of a field marshal in his knapsack, meaning that he had the opportunity to aspire to any rank however high, there are many illustrious examples of men who have come up from the bottom to the top.

All of the visitors, from the operative up to the head of the mill, coming from all sections of the South and meeting in Textile Hall every two years, taking pride in the performance of their respective mills, and noticing each succeeding two years what great strides are being made in the perfection of spinning and weaving, are cooperating to bring about conditions helpful to the industry.

The Southern Textile Exposition also brings to the South the northern man and New Englander, the men whose ingenuity and pluck and patience are largely responsible for the wonderful machines that are whirring in southern factories today. They are successful and thrifty. They are genial and cheerful. They give a hint here and a suggestion there; imparting the spirit of progress, and when the week is over we feel better off for their coming. We hope that their stay will be found of some value to them.

Bringing people together from different sections who are interested in the same industry, with the management of the Exposition constantly striving for higher ideals, wanting advice, wanting cooperation from all of its exhibitors, from members of the Southern Textile Association, and from visitors generally, it seems there is no doubt that we will keep this enterprise alive. It can be done with the support of the entire South, and we are confidently looking forward to the largest attendance we have yet had. Visitors who will write us a week in advance can be comfortably lodged.

William G. Sirrine, president and treasurer of the Southern Textile Exposition, Inc., spent his early days in South Carolina; was reporter on New York and Philadelphia newspapers for four years; was admitted to the bar in 1895; raised a company and was captain in the Spanish-American war for ten months; and is now engaged in active practice of law at Greenville, South Carolina. During the World War he was connected with the Department of Labor as manager of the operating division for the Hampton Roads District of the U. S. Housing Corporation. He has taken an active part for twenty years in good roads movements and civic matters. He is also director in the Greenville Chamber of Commerce.

The latest developments and recommendation for "White Way" street, boulevard and parkway lighting are interestingly described and illustrated in bulletin No. 43503-B, just published by the General Electric Company. Attention is particularly called to the fact that not only the utilitarian but also the esthetic is of equal importance in modern municipal electric lighting. Consideration of decorative effects is one of the direct factors entering into increases in real estate values.

Many elements are involved in selecting the most effective system of electric lighting for a municipality. Since the development of the high candle-power Mazda lamp the single light standard has supplanted largely the cluster form. Very appreciable economies in installation, consumption and maintenance as well as more graceful effects and greater distribution are secured.

The new styles of stands and diffusing, applied and stippled globes with metal or glass canopies are exceptionally artistic. Style in decorative lighting tends more toward slender and unobtrusive poles and globes of fine, graceful design. The bulletin offers a number of general suggestions, but the services of the combined Research Laboratories of the General Electric Company are always at the disposal of those interested for making proper selections and installations of Novalux units.

Fourth Southern Textile Exposition

Under this heading last month we published a story of the Fourth Southern Textile Exposition and its various concomitant features which will "take over" the city of Greenville during the week of October 18 to 23 inclusive. This month we want to reiterate our statement in that story that the Fourth Show is to be an "increased production and efficiency exhibition" and to present further facts indicating—in the vernacular of the circus advance agent—that this year's Show with its various adjuncts will be "bigger and better than ever."

The "S. R. O." sign was hung up in every Greenville hotel several weeks before the scheduled date of the Show's opening and the Housing Committee was called into service and their supply of accommodations in private Greenville homes was drawn on heavily. This means that there will be in Greenville during Show Week a probably unprecedented number of visitors. The "S. R. O." sign was also displayed at the Textile Hall when the late exhibitors applied for space, although arrangements have been made to care for a much larger number than was at first anticipated.

As stated last month, the semi-annual convention of the Southern Textile Association is to be held on the last two days of Exposition Week, October 22 and 23. Highly optimistic reports come in that indicate a record-breaking attendance of the membership of the Association.

The tentative program of the Association meetings follows:

10 A. M. Friday, October 22.
Address of Welcome by President of the Greenville Chamber of Commerce.
Response to Address of Welcome by T. W. Mullen, Supt., Rosemary Mills, Roanoke Rapids N. C.
President's Address by President H. H. Boyd.
Report of F. Gordon Cobb, General Chairman Sectional Committees.
Report of Textile Foundation Committee, David Clark.
Report of Cotton Committee, J. D. Buice, Pineville, N. C.
Address, "Cotton Grading," P. H. Partridge, Charlotte.
Address, "Finishing Cotton Goods," John W. Clark.
10 A. M. Saturday, October 23.
Address, Governor Cooper of South Carolina.
Address, "The Human Element in a Cotton Mill," Rogers W. Davis, Charlotte, N. C.
Practical Discussion by Members.
Business Session of Association.
Adjournment.

Again we wish to bring stress to bear upon the social and entertainment functions which will be given for the visitors to the Show and the exhibitors. There will be a dance in Cleveland Hall every evening, during the week under the chaperonage of prominent Greenville ladies, where the apostles of Terpsichore may "trip the light fantastic" from ten o'clock, when Textile Hall closes, until the hour of twelve. The Garber-Davis orchestra, under the leadership of Jan Garber, will furnish the music for these occasions. It will also render a musical program each afternoon and evening in Textile Hall.

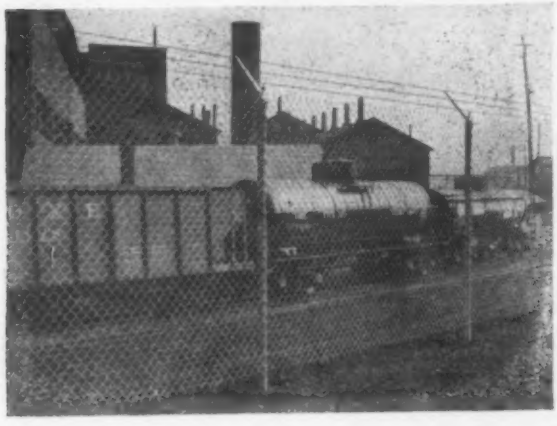
In addition to announced receptions at the various country clubs of Greenville and sightseeing trips among Greenville's textile mills, the Entertainment Committee of the Exposition has plans for a picnic on the top of famous Paris Mountain, on the evening of Friday, October 22, in honor of the members of the Southern Textile Association who visit the Exposition. The guests will be conveyed to a suitable spot on the mountain in automobiles provided by Greenville citizens and an old-time picnic supper will

be served them. Then, too, there'll be that good old Greenville spirit!

To again quote our friend of the world of sawdust, "Come one, come all" to Greenville!

Among The Exhibits.

Anchor Post Iron Works, with general offices at 165 Broadway, New York, and southern office at Greenville, have taken space 324 on the second floor. They are planning to show a stretch of high chain link fence, such as is used for mill enclosures, which will go along the back of this exhibit space. On this will be displayed or hung two display boards with photographs of various installations of interest. The front rail of this exhibitor's space will be formed by a low chain link fence in the center



of which will be an ornamental gate. The rest of the exhibit will made up of small samples, a full size sample of an Anchor post, photographs, etc. It is proposed to make this exhibit a simple one, direct in its appeal and attractive, and to show only what will be of interest to cotton mill men. An Anchor Post fence is shown in the accompanying illustration. This exhibit will be in charge of George W. Forster, manager of the southern office.

Hunter Manufacturing & Commission Company, 58-60 Worth St., New York City, will occupy sections 374, 375 and 376. The exhibit will be officially in charge of A. Culberson, Jr., the manufacturing specialist of the organization, whose headquarters is at Greenville. Mr. Culberson will be assisted by Robert F. Bowe and others from the New York office. Confidentially, "Bob" Bowe says their exhibit will not be elaborate but that they plan to have an attractive meeting place for their friends that will offer "Kool Kosy Korners" for those who have any matters to discuss. We are illustrating herewith the editorial idea of a "Kool Kosy Korner" but it is only fair to "Bob" to advise that they will distribute no souvenirs.

American Vulcanized Fibre Company, Wilmington, Del., will exhibit in spaces 203 to 206 inclusive, showing their line of fiber mill receptacles. This display will include the well known "Laminar" line of roving cans, cordage cans, mill boxes and warehouse trucks. The type of roving can which will be shown has been in extensive and satisfactory use for more than 30 years. These cans are made with both seamless and riveted bodies or cylinders. All are constructed with metal or fiber tops and metal or wood bottoms, with kicking bands made from fiber, steel clasped or all steel. The inside of each can is finished with moisture repelling coating, the outside being either varnished or painted as desired. These roving cans, as are all the "Laminar" products, are made from a tough, wear and fire resisting material known as "Vul-cot" fiber. It is probable that this company's line of fiber specialties will also be shown. This includes loom specialties, lug straps, bunters for pickers, brush backs, friction straps for jacquard, dobby or automatic looms, etc. This exhibit will be in charge of the vice-president of the organization, C. C. Bell, 12 Pearl St., Boston, and it is expected that H. C. Hackett, sales manager, will be on hand during the week.

A. A. Tuxbury Lumber Company, Charleston, S. C., manufacturers of "Quickbilt" bungalows, will be located in space 110. A main feature of this exhibit will be the showing in model of a modern cotton mill village of this type of building. This will be designed to show what a great variety of designs can be used in the building of a village, at the same time taking away that "cotton mill village look" from the village setting. A corner of one of this company's bungalows will be included in this exhibit in order that their material and method of construction may be thoroughly investigated. There will also be interesting and accurate accounts showing the records obtained in building some of these bungalows. The accompanying illustration shows one of the "Quickbilt" bungalows completely finished. It is stated that the construc-

tive details employed in the manufacture of these houses are entirely different from any other system and that this method is a distinct advance in the art of economical house building. The present scarcity of skilled mechanics prompted the adoption of this improved method in fabrication of material at the mill to reduce the work on the ground to a minimum. It is claimed that this company is the only manufacturer of ready-made houses owning and operating its own woods, mill and fabricating shed. Their source of supply is only thirty miles from Charleston, S. C. The result is that a five or six room bungalow of this type can be erected with two carpenters and two helpers in ten to fifteen working days, at a minimum cost.

When it is considered that all construction costs seldom run over $500 for larger homes and seldom over $200 for industrial quarters, it still leaves a way open for buildings to be constructed in these times of high prices and labor shortages. H. H. Baxter, manager of the "Quick-bilt" bungalow department of this organization, will probably be at the show and have charge of this exhibit.

THE LOVINGOOD COMPANY, 14 Walker St., Atlanta, will utilize spaces 305, 306 and 307. They propose to have on display samples of the products of the various companies whom they represent in the South. They will have on hand one of the famous McKinney "One-Man" trucks whose utility in a textile mill will be practically demonstrated. There will also be shown at this space the Signode system of baling and tying bales of cloth and yarn and securely strapping and sealing boxes. It will be remembered in connection with this system of baling that at the last show the Lovingood company used it to tie up any bundles which exhibitors shipping goods away from the hall would bring to their booth. The Bradley stencil cutting machine will also be demonstrated in this company's space. The

machine which will be used at the show will probably be one of the Giant type, shown in the accompanying illustration. This machine cuts letters 1¼ inches high and meets all export requirements.

A motor driven tiering machine, manufactured by the Revolvator Company, Jersey City, N. J., will also probably be shown. This is a new machine, having been on the market only about a year, and the Revolvator Company are the only makers of this particular type of machine.

The Cowan transveyor, manufactured by the Cowan Truck Company, Holyoke, Mass., will be shown for the attention of those interested in the subject of indoor trucking, as well as a number of photographs of these trucks.

The Rexford line of slasher tape, tape moistening machines and water proof papers will be on display. These are products of the Rexford Paper Company, Milwaukee, Wis.

The Chicago watchman's clock will also be included in the exhibit of the Lovingood Company. This is manufactured by the Watchman's Clock Works, Chicago, Ill., and since its introduction in the South has found extensive use in cotton mills in this section.

It is also planned to have on display at the Lovingood space a large cement coated nail about 6 feet high, representing and calling attention to the cement coated nails manufactured by the Steel & Wire Products Company, of Pittsburgh, Pa.

The Lovingood Company handles a very broad line of scales and these will be exhibited at the show. It is proposed to include in this scale exhibit a line of lap scales, platform scales, wagon scales, common and special scales of all kinds. The McKinney steel door-mat will also be shown.

Photographs of the Acme hydraulic presses of the Galland-Henning Company, of Milwaukee, showing these presses in operation under various conditions, will be on display.

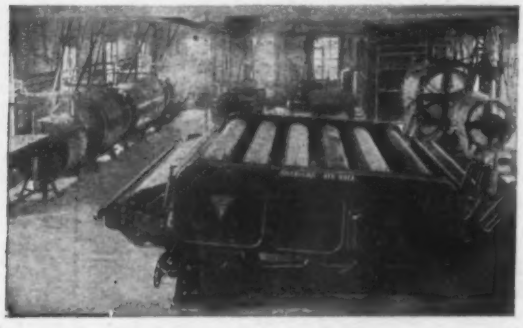
This interesting exhibit will be in charge of James A. Greer, secretary and treasurer of the Lovingood Company. It is expected that Alvin Lovingood, president of the company, will also be on hand, for two days at least, as will Harry M. Satterfield, the company's salesman in the Carolinas. There will also be in attendance representatives from some of the firms which the Lovingood Company represents. Among these will be R. D. Livingston, sales manager of the Signode System, Inc., Chicago, and W. P. Schuremen, vice-president and general manager of the Bradley Stencil Machine Co., of St. Louis. It is highly probable that a representative of the electric truck manufacturing department of the Cowan Truck Company will also be present.

THE HOPEDALE MANUFACTURING COMPANY, with home office and works at Milford, Mass., and with southern office at Greenville, S. C., will utilize spaces 147 to 154 inclusive wherein they propose to exhibit about three models of their new automatic loom as well as a fourth exhibit consisting of a plain loom made by some other manufacturer and changed over with their automatic attachments into an automatic loom, thus showing how adaptable these automatic attachments may be when applied to old looms already in operation. These looms will all be running although the kind of goods upon which they will operate has not as yet been announced. The exhibit will be under the general charge of Southern Manager Fredrick Sails, of Greenville, whose latest photograph is shown in the accompanying illustration. This was made at Spartanburg when Mr. Sails wasn't looking. We are using it in preference over a picture we have of Capt. George Otis Draper, the vice-president of the company, because our stenographer tells us she thinks he is a better looking man. However, Capt. Draper will be present at the exhibit as will Jonas Northrop, the president of the company, and Clare H. Draper, its treasurer.

SCANDINAVIA BELTING COMPANY, 40 East Hunter St., Atlanta, will have an exhibit located in space 174. They will show several rolls of Scandinavia belting in the sizes and thicknesses which sell most commonly to the textile

mills. They will also display a reproduction of a tandem spinning frame drive. This will be driven by a piece of 3-inch extra stout Scandinavia belting which has already been in service for three years in one of the larger mills in Carolina. It is stated by this company that their business with textile manufacturing plants in the southern field has been increasing during the past several years so rapidly that now it represents approximately one-half of the entire business done by the Atlanta branch of the organization. The exhibit will be in charge of Jefferson W. Carter, southern branch manager, who will be assisted by C. H. Cosgrove, Carolina representative; J. T. Starke, Georgia and Florida representative, and B. H. Rampley, Alabama and Mississippi representative.

AMERICAN LAUNDRY MACHINERY COMPANY, Norwood Station, Cincinnati, Ohio, will exhibit in spaces 204 and 205. They will have in actual operation equipment which is used in a mill village laundry. A typical mill laundry installation is shown in the accompanying illustration. They will also exhibit photographs showing their line of textile machinery and various American mill village laundry installations. It has now become a well established fact that



the mill village laundry has been the means of increasing the productive labor hours at every mill in which an installation has been made. It relieves the women workers at the mill from one of the drudgeries of home life and allows them to put full time in at the mill. The exhibit of this company will be in charge of H. G. Mayer, southern representative and W. S. Petty, both experts in textile mill machinery and mill village laundry equipment.

THE TEXAS COMPANY, through its sales office in Atlanta, has reserved spaces 45 and 46. We are advised that it is not the purpose of this company to enter an elaborate exhibit at the show, but rather to use their space to display a few samples of their products and to distribute interesting advertising matter. J. W. Littlefield, engineer salesman, and T. Q. Jones, agent at Greenville, will have charge of this exhibit. Other representatives of the company who will be in attendance are J. S. Jones, superintendent, Atlanta district; William Reynolds, lubricating assistant, Atlanta district; G. H. Seawell, general salesman, Atlanta district; William S. Thompson, superintendent, Norfolk district, together with other Norfolk representatives.

NATIONAL LAMP WORKS, Nela Park, Cleveland, Ohio, will be located in spaces 361, 362, 363 and 364. It is contemplated to have an exhibit which will be attractive and alluring enough in the way of chairs, settees, etc., to attract the friends, clients and competitors of this organization. They expect to exhibit the lighting units which are suitable for use in cotton mills, and have them so hung that a comparison may be made of their various qualities. Among these units will be the new standard RLM dome, the glass top dome, the Maxolite diffuser, the Holophane Prismatic reflector, the Ivanhoe Ace, and the Nela Trutint unit. The valuable little foot candle meter, now extensively used by engineers, architects and superintendents, will be displayed. Two of the newer lamps, the bowl-enameled Mazda C for industrial use, and the white Mazda for home use, will be also shown. In addition, there will be educational bulletins on the fundamentals of illumination, and bulletins on industrial lighting and other subjects will be available to visitors at this booth. James M. Ketch, district illuminating engineer, with headquarters in Charlotte, N. C., will be in entire charge of this exhibit and will be ready to help any who may have lighting problems. It is expected that a number of the company's salesmen will also be present among whom will probably be Mr. Baesel of the Buckeye division, Mr. White of the Fostoria division, Mr. Kopecky of the Shelby division, Mr. Hammond of the Sunbeam division and Mr. Rarick of the Nela Specialties division.

DAVID LUPTON'S SONS CO., Allegheny Ave. and Tulip Sts., Philadelphia, with southern headquarters at Atlanta, have reserved space 383. They will exhibit various types of Lupton steel sash products including the pivoted wall sash so commonly used in textile and other manufacturing buildings; the counter balanced sash used in industrial buildings and in schools and office buildings; a Pond continuous sash together with the Pond operating device, a mechanical operator which develops unusual power and therefore successfully operates lines of this sash of ex-

treme length. The application of Lupton products to modern textile buildings will be shown by photographs of actual installations. The accompanying illustration shows two Lupton installations; the lower view shows the

pivoted factory sash in a textile mill and the upper view the pivoted sash in side walls and also two lines of Pond continuous sash in the side of a roof monitor. Also exhibited will be several roof designs originated by Lupton service and which will be interesting to mill owners as being among the later developments in efficient daylighting and natural ventilation. This company recently opened offices and warehouse in Atlanta to give personal sales service in the southeast. William D. Calley, manager of this office, and Seth Ridout, agency manager, will be in attendance at this exhibit. It is also expected that C. F. P. Buckwalter, assistant sales manager of the company, will be present from the Philadelphia office.

The Barber-Colman Company, with main office and factory at Rockford, Ill., and southern office at Greenville, S. C., have reserved spaces 317 to 320 inclusive for the period of the show. This company manufactures the well known Barber knotter as well as warp-tying and warp drawing machinery suitable for every mill problem. However, we are advised by Southern Manager J. H. Spencer

that in all probability they will have no machinery on exhibit at all, the main feature of their exhibit being a good place to sit down. We have tried to show this "main feature" in the accompanying illustration. The exhibit will be in charge of Southern Manager J. H. Spencer and his assistant, N. H. Alford, from the Greenville office, while Field Manager R. E. MacCausland from Rockford, Ill., will also be in attendance.

J. Spencer Turner Company, 56 Worth Street, New York City, with southern office at 614 Commercial Bank Building, Charlotte, N. C., will be located in spaces 344 and 345 which they have reserved and where representatives of the company will be glad to meet their friends. This company is one of the oldest and largest commission houses and maintain a southern office in Charlotte for the purpose of keeping in close touch with spinners and users of cotton yarn in the South. Through this office they purchase their southern yarn and have recently directed their efforts toward knitters and weavers who buy yarn. R. McHardy Mauldin, of the Charlotte office, will be in charge of this space. Frank Walton, manager of the yarn department of the company will also be in attendance as will S. P. V. Desmond of the Charlotte office.

Standard Oil Company, Baltimore Division, have, through their Charlotte branch, reserved space 308 In this section will be exhibited a line of Gilbert & Barker Manufacturing Company's gasoline, kerosene and lubricating oil pumps, tanks and outfits. J. P. Lear, of Spartanburg, S. C., will be in charge of the exhibit and will be assisted by B. D. Williams and P. A. Barr, both of Charlotte, N. C.

J. R. Regnas & Company, 10-14 Tift St., Atlanta, Ga., will have spaces 230 to 233 inclusive. In this space they will show something of practically all the lines they handle including automatic tag tackers, box scrapers, box strapping—nailed and nailless, cement coated nails, floor trucks, fountain marking brushes, gummed labels and gummed tape in rolls, hoop iron in various styles and weights, marking crayons, nail pullers, scales, liquid glue, shipping tags, stencil board, stencil cutting machines, tag addressing machines, Deadlock tag fasteners, tape moistening machines and similar products. They anticipate making a somewhat more comprehensive display at this exposition than was the case in 1919. They will have three men in constant attendance to explain the new equipment and labor-saving devices which they anticipate showing.

The Greenville Textile Supply Co., of Greenville, S. C., will occupy spaces 329 to 332 inclusive with a very complete exhibit of general textile supplies. The exhibit will be in charge of H. O. Wallace, the treasurer of the organization, who always has a smile for his friends and a very keen eye toward the possibilities of every situation.

The Lunkenheimer Co., Cincinnati, O., will occupy spaces 211 and 212. They contemplate showing a display of valves in both iron and bronze, suitable for various steam conditions, ranging from the low pressures up to 350 pounds per square inch. These valves are designed for saturated steam as well as super-heat, carrying a total temperature of 800 degrees. In addition to the valves, this exhibit will also include a line of oil cups, grease cups and numerous other specialties. All of the fittings are manufactured on a strictly quality basis, the best material obtainable being used in the construction, so as to insure efficient service. The exhibit will be in charge of Jas. R. Anderson and Harry A. Burdorf.

Walton Advertising Agency, 219 Latta Arcade, Charlotte, N. C., have reserved space 226 and are contemplating a very novel exhibit which will doubtless attract much attention during the week. The space taken by them is a wall section, only three feet deep and they have devised a unique plan to give the booth more apparent depth. For the background of their space they will have a "drop" 11 feet high and extending the length of the booth. This will

represent a mountain scene, with the foothills and the lowland in the foreground. In the center of this picture will be a wide road running off into the mountains. This road will be continued to the floor of the booth and extended by the use of sand across the floor space to the entrance. At the entrance will be erected out of stone two large posts of rock and on top of these rocks will be ferns and moss. On each side of the road will be placed large easels on which will be displayed drawings, layouts of advertisements, cuts and other matter that go toward developing the advertisement reading to be placed into the newspaper or magazine. The front of the booth will be draped in dark cloth. Extended from the ceiling will be three drop lights with blue globes. The easels will be lighted with white lights, shaded with reflectors. A. G. Walton, assisted by his wife, will be in charge of the exhibit and will have on hand adequate information to furnish those who are interested in the subject of advertising.

Taylor Instrument Companies, main office and factory at Rochester, N. Y., and southern office at 418 Healey Bldg., Atlanta, will use space 242. They will have their usual exhibit of "Tycos" temperature instruments, including indicating and recording thermometers, temperature controls for slashers and other apparatus, humidity instruments, hydrometers, barometers, etc. The cut herewith shows the well known "Tycos" recording thermometer. H. M. Barker, of the Atlanta office, will be in attendance at this exhibit and it is expected that Mr. Carter, of the Baltimore office of the company, will also be present.

Allis-Chalmers Manufacturing Co., with headquarters at Milwaukee, Wis., will utilize spaces 239 and 240. They expect to have on exhibit two loom motors, one spinning frame motor and one centrifugal pump. They will also have on display several large framed photographs of complete hydro-electric power plants. They will have for distribution literature describing several kinds of machinery manufactured by them applicable to the textile industry. In this connection it might be well to note that approximately 70 per cent of the hydro-electric power supplied to the textile industry is produced by Allis-Chalmers equipment. This exhibit will be in charge of William Parker, sales engineer, of the Atlanta district office, who will have with him C. W. Steep, special textile engineer, from the Cincinnati factory. Other representatives who will be in attendance during the week to meet customers and friends will be: W. D. Taulman and J. C. Collier, sales engineer, Atlanta office, W. W. Moore, sales engineer, Charlotte office; W. H. Jannsen, sales engineer, Philadelphia office, and Berrien Moore, district manager, Atlanta, Charlotte and Birmingham offices.

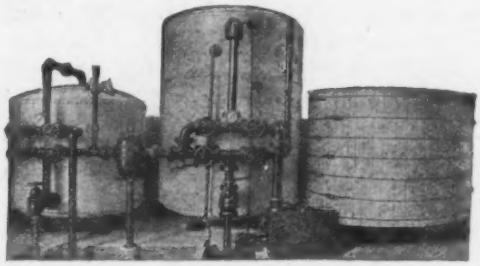
Rogers Fibre Company, Leatheroid Sales Division, 1024 Filbert St., Philadelphia, will exhibit their line of textile mill receptacles in booths 301, 302, 303 and 304. Their exhibit will consist of roving cans, warehouse trucks, doffing cars and boxes made from the well known "Leatheroid" which has proven its quality by extensive use in a large number of southern mills. An all fibre car is shown in the accompanying illustration. As has been the custom in the past, the southern mill supply dealers, through whom "Leatheroid" products are sold, will make booths 301 to 304 their headquarters during the Show and a cordial invitation is extended to all mill supply dealers to make themselves at home in these spaces and to bring their friends with them. A visit to the space occupied by this company should prove very instructive and interesting not only to textile mill people but to anyone interested in efficient and permanent factory equipment of this type. The exhibit will be in charge of Leon B. Rogers and James L. ("Sunny Jim") Nieukirk.

Huntington & Guerry, Greenville, S. C., will be in spaces 263 to 268 inclusive. Their exhibit will include examples of good practice in electrical wiring and a display of photographs of this mode of wiring. They will also devote a section of their space to the repairs of electric motors and other machinery and examples of the best practice in such work will be illustrated. This space will be arranged so as to give the friends and clients of the exhibitor maximum comfort and convenience. R. S. Huntington, president of the organization, DuPont Guerry, Jr., secretary and treasurer, and James McCabe will be in charge of the construction section of the exhibit; Carl A. Boy and R. L. Vaughn will be in charge of the repair section.

Whitin Machine Works, Whitinsville, Mass., have reserved spaces 19, 20, 21, 30, 31 and 32. It is announced by the company, however, that they are not in a position to make an exhibit this year. While they desire to show their good wishes to the association by having their representatives on hand and a space for the entertainment of their friends, they feel that the great demand today is for the production of machinery and therefore will not take the machines and men to make an adequate exhibit. However,

William H. Porcher and Robert I. Dalton, the southern agents, and W. D. Lyerly, special representative, will be at the exhibit and will be glad to greet the friends of the company at the spaces taken by them.

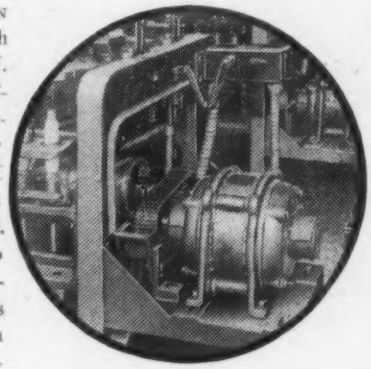
The Permutit Company, 440 Fourth Ave., New York City, with southern office at 435 Volunteer State Life Bldg., Chattanooga, Tenn., will utilize section 1 of the exhibition hall. They will exhibit small demonstrating water softeners together with a number of photographs, drawings, blue prints, etc., for various textile mill installations of their equipment. The demonstrating softeners which will be used are constructed in such a manner that hard water may be introduced at one end, and soft, zero water, containing no hardness, delivered almost immediately at the other end of the apparatus. The action is similar to that of the



large commercial softeners of this company and enables the interested visitor to see for himself how these systems work and to even make his own tests for the hardness of the water. The illustration shown herewith is of a Permutit water softening and clarifying equipment in a textile mill in New York State. It delivers 65,000 gallons of zero water per day, which is used in dyeing and processing delicate fabrics. The exhibit will be in charge of the company's southern manager, C. C. Harding, who will be assisted by F. F. Hubach of the Chattanooga office.

Clipper Belt Lacer Company, Grand Rapids, Michigan, will use section 229. They will exhibit the three different types of Clipper belt lacing machines which they manufacture, together with the Clipper hooks and rawhide and Fibro pins which are used in lacing belting. They intend to make a particular feature of a new belt lacing machine which is being put on the market this year for the first time and which is intended for lacing narrow belts. This is their Junior Clipper No. 1 belt lacing machine which is shown in the accompanying cut. This machine is made to lace belts up to two inches in width in two minutes and weighs less than three pounds. It is substantially built, and simple in construction and operation. Emil Kapprell, factory representative, will be in charge of the exhibit of this company.

The Keever Starch Company, of Columbus, Ohio, will utilize spaces 213 and 214 with an interesting exhibit consisting of samples of mill and laundry starches and by-products. Users of Victor mill starch will be interested in knowing that the Keever Company is making changes and enlargements at its factory which, when concluded, will allow a much greater production of this well known product. The exhibit will be in personal charge of Capt. James H. Maxwell, the southern agent for the Keever Starch Company, whose genial countenance will be noted in the accompanying illustration. It is also expected that Charles L. Kurtz, president of the Keever Company, Charles J. Kurtz, its general manager, as well as Jack Iler and Dan Wallace, southern sales representatives, will be in attendance.



Morse Chain Company, with works at Ithaca, N. Y., and southern office at 404 Commercial Bank Building Charlotte, N. C., will have their exhibit in spaces 37 and 38. They propose to have several interesting textile drives showing Morse chain applications to textile machinery with a practical demonstration showing the advantages of chain drives over belts and giving proof of the increased production to be gained by the use of chain drives. The accompanying cut shows the application of this type of chain to a spinning frame with individual motor. This will probably be one of the practical applications to be shown at this exhibit. Photographs of actual installations and figures showing results obtained also will be shown to those visitors interested. George W. Pritchett, the popular manager of the company's southern office, will be in charge of this exhibit and will be assisted by H. E. Matthews, sales engineer for the company, who makes his headquarters at the Charlotte office. It is also expected that during the week A. B. Wray, sales engineer, and V. D. Morse, manager of sales, both from the Ithaca office, will be in attendance.

The Hussong Dyeing Machine Company, Groveville, N. J., will occupy spaces 155, 156 and 157. They will have in operation a Hussong combination machine equipped with carrier for skein yarn dyeing and bleaching, and cage for raw stock, stripping, chroming, washing and dyeing. This

machine will be of 15 pounds capacity, will be electrically driven, and will be loaded with skein yarn, so that those interested can gather a definite understanding of the circulation of the liquor as it completes its cycle of flow in both directions. The machine will have transparent sides, affording every opportunity to study the effect of the circulation on the skeins within, how they are lifted off the hangers with the flow of the liquor, how the interstices are filled with the mass of skeins, preventing channels and how an even temperature is maintained throughout the bath.

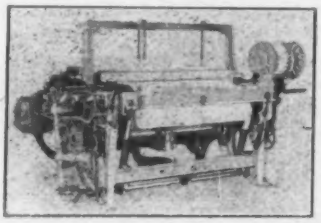
Also exhibited in these spaces, in the name of the National Flue Cleaner Company, which is owned and controlled by the Hussong Company, will be a model of the National soot blower. This blower, which has been on the market for several years, has many advantageous mechanical features which will be explained to those interested at the exposition. This exhibit will be in charge of J. Harry Thompson, assisted by W. J. McElmoyl.

Charlotte Leather Belting Company, Charlotte, N. C., will have an exhibit in spaces 209 and 210. This exhibit will include the usual display of leather belting and leather specialties, the outstanding feature will be a display of Packide belt specially designed for cone drives. This exhibit will be supervised by C. M. McClure, assisted by F. R. Cochrane. Mr. McClure has had practical experience in operating cotton mills, having had charge of mills in South Carolina. Therefore, his opinion of what is best suited for textile mills has been very beneficial in assisting the company to bring out various features and his suggestions to mill superintendents are often used to good advantage.

The Ideal Stencil Machine Co., with general offices and factory at Belleville, Ill., will exhibit in space 291, displaying their Ideal stencil machine and a complete line of shipping room supplies and equipment. This stencil machine is shown in the accompanying illustration. These machines insure proper shipment by giving a clearly imprinted and easily distinguishable address. They are great time and labor savers. Demonstrations will be given with the machine on exhibit by representatives. An additional feature of this exhibit will be the new machine steel filing cabinet, which is equipped to file 2,500 stencils. In charge of this display will be J. W. Marsh, manager of sales of the organization, and B. L. Sronce, agency manager in North Carolina.

The Greenville Folding Ladder Company, of Greenville, S. C., will use space 356 wherein they will exhibit and demonstrate the folding ladder which they sell. This is light, handy, easy to carry and adjustable to uneven floor or ground, and has proven extremely useful for painters, electricians, machinists and others. This display will be under the supervision of Frank M. de Saussure, Jr., the inventor of this folding ladder, and Harry Wilkins, another member of the organization.

S K F Industries, Inc., 165 Broadway, New York City, will show, in sections 22 to 25 inclusive, a hanger model which is to bring out the relative power saving advantages of plain and ball bearing hangers. The two shafts will be 1 15/16 inches by 10 feet, one shaft being supported by S K F ball bearings, the other by a good make of ring oiling babbitted bearings, the bearings being spaced 51 inches apart. In the demonstration a pressure of 1,500 pounds will be applied to each shaft by means of two levers, each having a load ratio of 30 to 1 and 50 pound weights, thus creating 500 pounds of friction pressure per bearing. It is stated that in this exhibition the following points will be brought out: The motor, running idle, consumes eight-tenths of an ampere. The ball bearing shaft, under a full load of 1,500 pounds, requires only nine-tenths of an ampere, with a linen thread turning the shaft at 200 r. p. m., while the babbitted bearing shaft, under similar load conditions, requires two and four-tenths amperes with a 2-inch leather belt doing the work. In other words, it is proposed to show that the ball bearing shaft actually consumes one and six-tenths amperes, that the babbitted bearing produces sixteen times as much frictional resistance as the ball bearing, and that the ball bearing eliminates 93 per cent of the babbitted bearing's waste. Representatives who will be in attendance at this exhibit will include W. H. Holby, district manager, with headquarters in Atlanta, Oliver Stangland, manager transmission department, and R. C. Byler, advertising manager, of the New York office; S. M. Smith, of Greenville, and E. M. Potter, of Charlotte.



Mason Machine Works, Taunton Mass., will have on exhibition a number of automatic looms, one of which will be a 20 harness, 40 inch dobby loom, run on a 16 harness fancy weave. Two 40 inch looms, in this exhibit, will be run on 2 harness work, and these looms will be operated in competition during the entire exposition, making comparative tests running at different speeds.

One Loom with a Patented Shuttle-Lock Attachment Versus

One Loom without a Patented Shuttle-Lock Attachment

This should make one of the attractive loom features of the show. The shuttle-lock, which this company will exhibit, is a patented feature and was primarily designed to control the shuttle with such precision as to reduce the shuttle and bobbin breakage to a minimum and give 100 per cent battery operation. With the use of this new patented mechanism, the fixer sets the feeler within one-eighth of an inch of the tip of the shuttle. While this loom is operating, it will be shown how it is impossible to operate a loom satisfactorily with the shuttle feeler so closely set to the shuttle without a shuttle-lock unless a heavy pick and a very tight shuttle-box is used to wedge the shuttle. While the shuttle-lock was not primarily constructed for speed, it has great speed possibilities. The makers, however, are cautious about advising any great increase in speed; at the same time, they believe many mills could benefit by a slight increase in speed with a corresponding increase in production, and accomplish this

with less breakage to bobbins and shuttles by the use of this new device, operated in connection with their battery loom.

The Mason-Crompton loom has many other features such as the variable misthreading device which makes it possible to arrange to stop on the second, third or fourth bobbin, as desired. This change is made without the use of a wrench and is done almost instantaneously.

The warp stop motions which will be exhibited on the Mason-Crompton looms are mechanical motions of a hypersensitiveness and are modelled after the Crompton type, so well known in the gingham and colored cotton goods mills throughout the country.

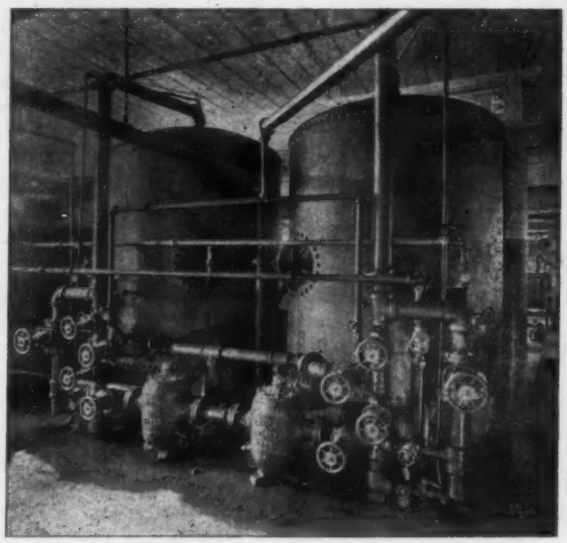
One of the features of the Mason-Crompton loom which strikes the eye of the loom fixer is the manner in which the shuttle feelers are arranged. They are fulcrumed outside the loom frame instead of underneath the breast beam of the loom. A new patentable tip holder, also, will be applied to all these looms and the makers claim many advantages for this tip holder, such as less damage to bobbins or quills.

The dobby automatic loom in this exhibition is manufactured in its entirety at the Mason Works and is the only dobby automatic loom, it is said, completely manufactured in one works. The feeler motion on this loom is of a most simple construction and is of the notched-feeler type although it is not a sweeping-feeler in any sense of the word. This, also, is a new patentable feature exclusively manufactured by the Mason Machine Works.

Edwin Howard, southern agent, and Randolph Crompton, in charge of the automatic loom department, will have charge of the exhibit and will be in Greenville while the exhibition is in progress.

American Scrubbing Equipment Company, with general offices at 180 North Wabash Ave., Chicago, have reserved spaces 296 and 297. They will exhibit their large system, known as the No. 5 Finnell system of power scrubbing and also their No. 10 system. They will also display their well known Finola scouring powder and Solar soap powder. The machines which will be on exhibit are well known to many textile men, having been installed by a number of successful mills. In the Finnell system, the machine is electrically driven, distributes its own water and powder, and it scrubs. It is followed by a water absorber which picks up the filthy water after the machine has thoroughly scrubbed the floor. The smaller sized machines will run under anything six inches from the floor and will scrub, polish or wax. This makes them especially adaptable for cleaning under various textile equipment. It is of interest to note that 65 southern mills are operating the Finnell system which were purchased since the last exposition. Over 200 textile mills in the United States are now using this system. One of these machines is shown in the accompanying illustration. Reuben Finnell and J. W. Farris, Jr., the sales manager of the company, will be present at this exhibit.

The American Water Softener Co., 1011 Chestnut St., Philadelphia, Pa., will occupy space 18 with an exhibit of their Decalso zeolite water softener. Soft water is practically indispensable for the finishing end of any textile establishment as it eliminates waste of soap, dyestuffs and water, produces superior and more uniform colors as well as a better feel, makes matching easier, reduces redyes, and prevents spots, bad odors, etc. The use of zero water saves from 5 to 25 pounds of soap per thousand



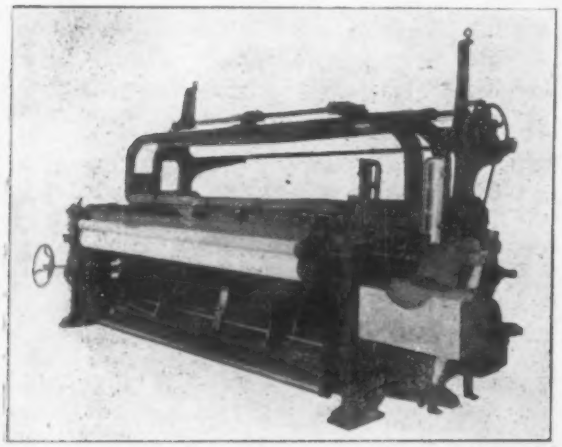
gallons of water, depending upon the hardness of the original water. The illustration herewith shows one of the Decalso installations. Soft water is also desirable in many other places around a textile plant and the representatives in charge of this exhibit will be glad to explain its advantages to interested visitors. W. T. Runcie, general sales manager; G. W. Graybill and R. W. Conard are expected to be in attendance.

J. E. Sirrine & Company, engineers, 309 South Main St., Greenville, S. C., will occupy booths 206, 207 and 208, where they will be ready to welcome and entertain the host of clients and friends of this company. They propose to show a typical series of drawings and designs outlining some of the latest plants designed by them, and will have for distribution a number of interesting booklets and catalogs for callers at this space. They will also have a stenographer available for the use of any of this company's clients who may desire her services. The exhibit will be in charge of their various department heads including Messrs. Riley, Wrigley, McPherson, Hagerman and Sirrine.

Diamond State Fibre Company, Bridgeport, Pa., will occupy spaces 215 to 217 inclusive and will exhibit samples of their well known Diamond F line of fiber receptacles on which they have specialized for thirty years. These fiber receptacles combine strength and durability with light weight and convenience and are impervious to oil and grease. It is stated that the close texture and smooth sur-

face of the fiber prevent the clinging of dust and dirt to the body of the receptacles, and that the smooth interior makes it impossible for the contents to catch. They are fire-resisting, sanitary and easily cleaned. In the exhibit of this company will be included samples of fiber trucks, barrels, mill boxes and baskets, doffing cars, roving cans, and round tapered and straight style waste baskets. It is also intended to present as souvenirs small pocket combs made from Diamond fiber. A. M. Fraser, district sales manager, with headquarters in Greenville, will be in charge of the exhibit, assisted by Charles S. Pressel, who is in charge of the mill supply department at the main office.

HYATT ROLLER BEARING CO., New York City, will occupy spaces 279 to 282 inclusive and in their exhibit will stress the application of their product to textile mills, both in the power transmission end and in the machinery. There will be a complete line of transmission bearings, with several types of hangers; also a complete exposition of the Hyatt bearing as applied to looms, spinning frames, cards and other textile machinery and a set of bearings in housings suitable for these types of machines will be displayed. In addition there will be devices and sample bearings in order to show the construction of the bearing itself and its principal advantages. Among these will be a large Hyatt bearing in operation with the housing cut out so that the functioning of the bearing can be observed in detail. There will be shown several bearings operating in glass housings to show the manner of distribution of lubricant which the bearing effects. This exhibitor will also give out descriptive literature, bearing particularly on the textile field. Two transmission engineers will be present to explain the economies to be effected in the use of roller bearings in power transmission as will an engineer thoroughly trained in the design and operation of textile machinery



THE STAFFORD COMPANY, Readville, Mass., manufacturers of the well known "Ideal" automatic loom, have taken the entire section composed of spaces 67 to 80 inclusive, on the ground floor. They will have in operation several of their looms, both of their shuttle changing and bobbin changing looms. Each loom will be weaving a different fabric and one of the looms will be their 84-inch automatic tire fabric loom, which will be making a standard tire fabric, 17¼ ounces per square yard. Among the representatives of this company who will be present during Show week will be S. R. Fuller, Jr., president; G. P. Erhard, treasurer; S. S. Jackson, D. C. Dunn, Walter Smith and W. J. O'Hara.

J. KIRK ROWELL CO., INC., Atlanta, southern representatives for handling equipment, labor-saving appliances and iron and steel specialties, have taken spaces 261 and 262 where they will display various items for which they are the southern agents. In eight other sections contiguous to the space reserved by this company will be exhibited and displayed other equipment which they handle. Among these will be the Morris line of canvas baskets and trucks and Zering trucks. These exhibits have received mention in other parts of this story. The Rowell Company will display in their spaces some of the equipment they sell and will also have supervision of the exhibits of the companies which they represent whose spaces are in juxtaposition with their own exhibit.

They will show the H. & H. mill type lockers which are proving very popular in textile mills as a means of obtaining cleanliness and convenience and preventing pilfering.

"Puritan" cantonment drinking fountain, manufactured by the Halsey W. Taylor Company, Warren, Ohio, will be displayed. These fountains are made in several various types, including pedestal, wall type and cooler styles which are equipped with either vitreous china or spun brass fountain heads. They will also show the Columbus all-steel doffing and roving trucks and boxes and the lap trucks of this type.

The Handy Andy one-man truck will be included in the exhibit of the Rowell Company. This truck furnishes an unusual amount of lifting power by a peculiar adaptation of a movable axle, making it possible, it is claimed, for one man to lift and truck a 1,500-pound load much more easily and with less expenditure of energy than would be the case with an ordinary truck.

J. Kirk Rowell, president of the company, will be in attendance at these exhibits some time during Show Week, while the various district managers of his organization will also be present. His genial countenance is depicted in the accompanying illustration.

AMERICAN KRON SCALE COMPANY, New York City, will use spaces 259, 260, 271 and 272 for their exhibit which will be under the charge of the Rowell Company. They

will display different types of Kron scales, a new feature being the oil pot mechanism. A very unique motor-driven demonstration will be made showing the action of this new oil pot and its stabilizing effect upon the scales. Representatives of the New York office will doubtless attend this exhibit.

The H. Zering Manufacturing Co., truck specialists, Cincinnati, Ohio, will have space 269 for a display of their industrial and warehouse trucks. This exhibit will include a display of the more popular types of textile trucks and will also have a unique display of casters. This company's line covers the standard roll and bolt trucks, dyehouse and platform trucks and bale trucks, as well as truck trailers adapted for light, medium or heavy duty. They make the A-Z perfection truck and are also the manufacturers of casters and wheels of the heavier type to fit practically every industrial need, from a small caster for yarn baskets to extra heavy duty casters for trailer trucks. This exhibit will be in charge of J. Kirk Rowell, president of the company that bears his name, who is the southern representative for the Zering Company, with office at Atlanta. Associated with Mr. Rowell will be T. T. Lay and W. P. T. Mills, in charge of the Charlotte office, and Mr. Bennett.

Morris & Company, Inc., Groveville, N. J., will exhibit in section 270. They expect to show a full line of Morris duck mill baskets including their oblong baskets; round, square-bottom baskets; square basket, and steaming baskets. All these types are furnished with either steel or wood runners. The Morris truck, furnished with rubber tired wheels, ball bearing casters and thread guard casters when specified, will also be shown. Many years of service under various conditions have demonstrated the extreme durability of cotton duck for a basket covering. Its wearing qualities are remarkable. A high grade, closely woven, heavy cotton duck is used in the Morris duck basket. After this duck covering is sewed over the frame, the rim is bound with a pliable chrome leather, which wears smooth and hard. The accompanying illustration shows the oblong type of this basket, with steel runners. This line of basket is handled in the South by J. Kirk Rowell Co., 716 Empire Bldg., Atlanta. W. J. McElmoyl, of the Groveville office, will doubtless spend a large part of show week at this space.

The Walraven Company, 36-38 West Alabama St., Atlanta, have spared no expense in making their exhibit the most complete of its kind ever shown in the South. They will be located in spaces 51, 52, 53, 62, 63 and 64. They will have on exhibit the well known Brown & Sharpe universal milling machine and the Brown & Sharpe automatic gear cutting machine. The universal milling machine was first brought out in 1861-62 by Joseph R. Brown, founder of the Brown & Sharpe Company. Since the first type was brought out, the demand for milling machines has increased so greatly that there are now thirty-eight kinds and sizes manufactured by the Brown & Sharpe Company, besides numerous attachments and accessories. The automatic gear cutting machine was invented in 1877. There has since been developed by the Brown & Sharpe Company a full line for cutting bevel and spur gears. Machines for cutting the teeth of racks, also of spiral gears and for generating theoretically correct teeth in bevel gears have also been designed to meet the various needs of gear cutting. The Brown & Sharpe Company's products have received the highest awards in all cases where they have been exhibited, including the International Expositions, at London in 1862, Paris 1867, Vienna 1873, Philadelphia 1876, Chicago 1893, Paris 1878, 1889 and 1900, Brussells 1897 and 1910, St. Louis 1904, Liege 1905, Milan 1905, Turin 1911. Medals have been received for work done in safeguarding and sanitation in the factory. A. E. Mandeville, from the Brown & Sharpe Company, will be present to demonstrate the universal milling machine and automatic gear cutting machine which will be in operation. The Walraven Company are exclusive southern representatives for the machine tools of the Brown & Sharpe Company.

In addition to the exhibit of the Brown & Sharpe machines at the Walraven Company's space will be demonstrated the Hendey Lathe and the Hendey Shaper which will be in charge of L. A. Quinn. Others from the Walraven Company who will be in attendance during the week will be J. C. Walraven, J. D. McCord and J. M. Fraser.

Graton & Knight, Inc., leather belting, with southern branch at 93-95 South Forsyth St., Atlanta, have taken spaces 218 to 224 inclusive wherein they will probably have an operating exhibit. They will show various types of Graton & Knight belting which are applicable to textile use and their line of leather specialties. Wilkins Cagle, representative for the company in South Carolina, will be in charge of the exhibit and will have associated with him John D. Patterson, Edw. E. Taylor and J. F. Kelley. H. M. Bonney, manager of the Atlanta office, will be in attendance sometime during the week.

The Greist Manufacturing Co., New Haven, Conn., have secured space 530 in which they will exhibit a line of spinning rings and drop wires. This company has had 49 years of experience in metal working and has produced a fine polished pressed steel spinning ring, impregnated with carbon and glass hard. They also are in a position to make spinning ring holders. This company recently purchased the Woodbury Company, manufacturers of loom drop wires, and are now in a position to furnish the satin finished drop wires of that company. W. T. Palmer, advertising and sales manager, and Mr. Fraser, assistant general manager in charge of manufacturing, will be present at this exhibit.

J. S. Hulme, Atlanta Trust Company Building, Atlanta, has reserved spaces 54 to 57 inclusive on the first floor for demonstrating the various products which he handles in the South. Mr. Hulme is southern representative for Borromite water softening systems, Economy presses, Watson motors, conveying machinery, cranes, air and electric hoists. He advises that space 54 will be utilized for the exhibit of the Borromite Company which will include a demonstrator in operation using Borromite to soften water. J. D. Stover, sales manager of the Borromite Company will be present at this demonstration. Space 55 will be occupied by the Mechanical Appliance Company, Milwaukee, Wis.,

who will have in operation their well known Watson motor. W. B. Crabtree, sales manager, from the Milwaukee office, will be in attendance at this exhibit. The Economy Baler Company, Ann Arbor, Mich., manufacturers of the all-steel Economy fire-proof baler, will have space 56 for a display of their products. Space 57 will be used by Mr. Hulme to greet his many friends and customers who are invited to visit his space during the week.

PARKS-CRAMER COMPANY, Fitchburg, Mass., and Charlotte, N. C., have taken sections 108 and 109. Owing to the great amount of business on their books and due to their inability to furnish material on immediate delivery, they state they do not feel justified in having an elaborate exhibit this year. They have, however, taken their usual space where they will have on display two of their high duty humidifier heads and where representatives of the company will be glad to meet their many friends and customers. John F. Porter, with offices in the Candler Building, Atlanta, will have charge of the exhibit, being assisted by J. D. Smith, of the Charlotte office. William B. Hodge, manager of the Charlotte office, and other members of the organization will also be present to greet visitors at this space during the week.

SWAN & FINCH, 522 Fifth Ave., New York, will have spaces 126 and 128 exhibiting their well known textile mill lubricant, "Slo-Flo," which has been particularly successful in reducing lubrication costs and at the same time has insured freedom from oil stains, a very important point to the textile man. It is expected to have in operation a Draper loom, and possibly a comb box lubricated with "Slo-Flo," with an additional display of samples and literature. The company's well known southern representatives, Lindsay Padgett of Charlotte, Hague Padgett of Forest City and B. M. (Buck) Lattimore of Atlanta, will be in attendance at this space throughout the week. N. W. McGrew, their textile lubrication engineer, expects to be present throughout the week also, with R. Thackray, manager of sales, eastern department, in attendance part of the time.

THE MATHIESON ALKALI WORKS, INC., with executive offices at 25 West 43rd St., New York City, will be located in spaces 124 and 125 with a display of "Eagle Thistle" products and other heavy chemicals which they manufacture. This company recently opened southern district sales office in the Commercial Bank Building, Charlotte, N. C., and their southern sales manager, E. E. Routh, will be in attendance at their exhibit during Show Week.

LINK-BELT COMPANY, 910 South Michigan Ave., Chicago, Ill., will use spaces 112, 113 and 114, and will probably have their stereomotorgraph on display which, by interrupted vision, "slows down" the action of one of their chains in operation. Also different sizes and types of chains applicable to textile work. J. S. Cothran is southern agent for this company.

THE SHERWIN-WILLIAMS COMPANY, Cleveland, Ohio, will be located in spaces 338 and 339 with display of their line of textile paints. Representatives of the company will be in attendance.

CURTIS & MARBLE MACHINE CO., Worcester, Mass., manufacturers of cloth finishing machinery, have taken spaces 129 and 130. They advise that owing to the amount of work which they have on hand, they will not have a moving exhibit this year. They will have a number of photographs of the different machines which they manufacture and a projectograph which will display a large number of these machines, together with some other slides which will doubtless prove of interest. Edwin H. Marble, president of the company and well known to textile mill men, will be in charge.

THE BAHNSON COMPANY, Winston-Salem, N. C., have reserved space 2 wherein they will exhibit their Bahnson humidifier. As each humidifier is a complete and independent unit, the system as installed in a mill can be readily exhibited and fully understood. Two machines will be exhibited, one mounted as in a mill and in continuous operation. A second unit will be so placed as to allow the fullest possible examination by those interested. This particular type of humidifier has not been exhibited at any previous textile show, it is stated, and this, together with the fact that this system has been adopted by a number of southern mills, should make this exhibit particularly interesting. W. Smith Williams will be in charge, and associated with him will be F. F. Bahnson, Joseph Williams, W. H. Sloan, G. B. Roberts, William Butler and L. G. Cadmus.

REEDER & COMPANY, 60 Broadway, New York City, have taken space 508. They will exhibit their line of dyestuffs and the well known textile solvent, Zavon. This is a natural solvent for foreign matters such as mineral oils and graphites, dirt, etc., inasmuch as it contains a powerful solvent whose action on soaps, oils and waxes is almost instantaneous. Zavon can be used on all kinds of vegetable fibers with no injurious effect on the fibers or on the receptacle in which it is used. George A. Reeder, vice-president of the organization, will be in personal attendance at this exhibit.

ROESSLER & HASSLACHER CHEMICAL COMPANY, New York City, will use spaces 410, 412 and 414. They will doubtless have on display various textile products bleached by different mills with this company's peroxide process. A bleaching expert from the bleaching station at Perth Amboy, N. J., will no doubt be present together with representatives from the New York office who will be glad to explain the different processes of this company.

E. I. DU PONT DE NEMOURS & CO., Wilmington, Del., have been assigned a space 20 by 20 feet wherein they will no doubt have a display of the extensive line of dyestuffs of their manufacture. John L. Dabbs, Charlotte, N. C., is the southern manager for this company. Mr. Dabbs is receiving the felicitations of his many friends on his recent journey to the hymeneal altar. He will probably have supervision of his company's exhibit at the Show.

WAYNE OIL TANK & PUMP COMPANY, Fort Wayne, Ind., had been assigned no definite space as this is written, but will doubtless have a display of their oil storage systems under capable supervision. They also manufacture oil filtration systems, oil-burning systems, furnaces for metal melting, forging and heat treating.

JOSEPH A. VOGEL COMPANY, Wilmington, Del., have been given space 142. This company manufactures the patented Vogel frost-proof wash closets. These closets have enameled roll flushing rim bowls, heavy brass valves, strong hardwood seat, galvanized tank, malleable seat castings, and are tested under hydraulic pressure before leaving the factory. Representatives of the company will be in attendance.

National Aniline & Chemical Company, Inc., 21 Burling Slip, New York City, will use a space 20 by 20 feet. They will doubtless have therein a comprehensive exhibit of "National" colors. W. L. Willard, Charlotte, N. C., handles the southern territory for this company and will doubtless be on hand with other representatives at their exhibit to greet their many friends and customers.

E. S. Player, manufacturers' agent, Greenville, S. C., has reserved a section of spaces on the second floor, spaces 249 to 256 inclusive, wherein will be exhibited and demonstrated the products of some of the companies represented in the South by Mr. Player. In the next following paragraphs are given descriptions of some of these exhibits:

Portable Machinery Company, Passaic, N. J., will utilize spaces 244 and 245 of the section reserved by Mr. Player. They will exhibit their scoop conveyor, shown in the accompanying illustration. A small conveyor of this type has proved to be very advantageous for small-scale work, as it cuts in half the labor of feeding required by the larger type, and can do many small jobs for which the larger machine is not fitted. The distinctive feature of this machine, and the one which gives it the name of "scoop

conveyor" is the scoop on the feeding end. This scoop can be pushed into the material to be conveyed, even to the point of actually burying it therein, if necessary. It is stated that two men with one of these conveyors can do the work of from six to twelve men, depending upon conditions, thus obtaining a great saving in labor, time and cost. The coal carrying capacity of the twelve-inch conveyor, equipped with skirt plates which gives a belt greater capacity, is one ton per minute. Representatives of the Portable Company will probably be at the show in connection with this exhibit.

Safety First Supply Company, Pittsburgh, Pa., will have an exhibit in spaces 246 and 247, under the personal direction of Mr. Player, which will include a pyramid of Diamond porcelain enamel signs. These signs are of extreme importance in the safety work of textile plants and are very durable. They are manufactured of five coats of porcelain enamel, fused at 2000 degrees heat on 18 gauge iron. These signs are very attractive and effective and

have been adopted by many leading industrial concerns of the country in their safety and accident prevention work.

A display of Diamond all-steel playground apparatus will also be seen in this exhibit. This display will show the construction of the patented, one-piece, galvanized, malleable iron joint which is an exclusive feature of this type of playground apparatus. It will also show the construction of the swings and other parts of this apparatus. A special feature will be the Diamond illuminated safety bulletin boards equipped with electric lights and removable beaver board backs. The illustration herewith shows one of these boards in practical use. They are proving very valuable as a means of calling attention to various plant activities, safety work, notices, reports, etc. First aid cases, respirators, goggles, machine guards, etc., will also be included in this exhibit.

Morehead Manufacturing Company, Detroit, Mich., will use spaces 255 and 256. A complete Morehead Back-to-Boiler system will be exhibited and representatives will explain how this modern method of steam drainage will effect a fuel saving of from 20 to 50 per cent and at the same time greatly increase the efficiency of steam heated machinery.

Textile manufacturers using this system are making use of steam after it has exerted its expansion energy. They are utilizing the live tangible heat units that are left—representing so much coal—by returning the heat units in the form of pure hot water direct to their boilers. They realize that by taking out all condensation as it forms in steam lines, coils, slashers, etc., and returning it to the boilers, the Morehead system not only affects fuel saving but increases the efficiency of steam heated machinery and equipment. Because the water of condensation is returned at practically the same temperature that it leaves the boilers as steam, many textile manufacturers report that their fuel saving is as high as 50 per cent. The Morehead system returns water of condensation at 275 to 312 degrees, while with steam pump the water must cool down to 212 degrees before the pump can handle it. As evidence of the interest being shown by cotton manufacturers in the Morehead system, we are reproducing extracts from some letters written by representative mill men regarding this apparatus.

Camperdown Mills, Greenville, S. C. "The Morehead

system is giving very good results and we feel sure it is saving us considerable coal, although we have not had an opportunity to check up on our coal since the system has been put in."

Amazon Cotton Mills, Thomasville, N. C. "We are more than pleased with the results we are getting from this trap and do not see how we got along without it. It saved us the expense of having to put in another boiler and has not given us a particle of trouble in the two years that we have had it in use."

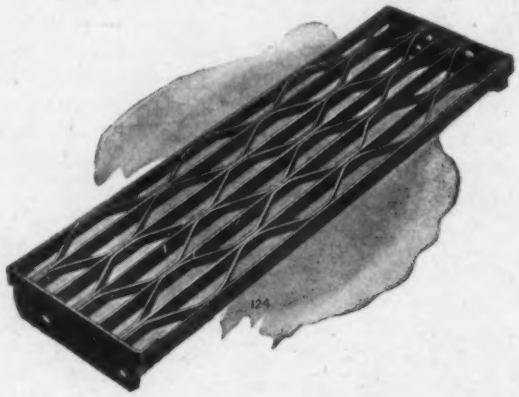
Virginia Cotton Mills, Swepsonville, N. C. "We have been using the Morehead return steam trap on our boiler systems for the past year and a half, and are very much impressed with the fact that we are saving considerable fuel by doing so. The traps are working entirely satisfactory and the upkeep to the present time has amounted to virtually nothing."

Elmira Cotton Mills Company, Burlington, N. C. "The Morehead traps are working very satisfactory. We are using them on both high and low pressure, with good results, and I (the superintendent) think we had one of the worst conditions of draining in order to get all of our waste steam back to the traps that you are likely to run up against. We find that in addition to considerable saving in steam that we are able to cut out running our deep well pump which supplies all of our water about four to five hours per day, which alone is a considerable saving."

In attendance at this exhibit will be A. Fitzgerald, general manager of the Morehead Company, and R. C. Gammon, sales manager, from the Detroit office; W. B. McBurney, Atlanta; Grant Estlow, Graham, N. C.; and Mr. Player.

ALLEN SPINDLE CORPORATION, 80 Boylston St., Boston, will exhibit in spaces 333 and 334 with a complete line of Allen ball bearing twister spindles and their component parts. The fact that this company has brought out a highly scientific type of spindle and that there is over eight years of practical experience behind this patented design of anti-friction spindle should attract attention to this exhibit. This ball bearing spindle is shown in the accompanying photograph. A new booklet entitled "Would Increased Production From Twisting Frames be of Value?" will be distributed to mill men operating ring twisters. The exhibit will be in charge of Elliott A. Allen, president of the corporation, and Elwin H. Rooney, sales manager, assisted by G. G. Slaughter, southern representative of the organization.

CROMPTON & KNOWLES LOOM WORKS, with executive offices at Worcester, Mass., will occupy spaces 162 to 171 inclusive. They will exhibit a 4 by 1 box four-color automatic gingham loom, 40½ inches between swords. They will also show an automatic damask loom with jacquard, 2 by 1 box, 74½ inches between swords. Also a four-color automatic, jacquard, cotton blanket loom. It is also announced that they will have a staff of weavers, fixers, etc., to operate this machinery. W. H. Wylie, from the company's southern office, will be in charge of the exhibit and it is expected that the following people will also be present: F. W. Howe, vice-president; J. C. Dantzler and Philip B. Heywood, from the Worcester office; and S. B. Alexander, Jr., and E. E. Garsed, from the southern office.



IRVING IRON WORKS COMPANY, Long Island City, New York, will use spaces 160 and 161. They will exhibit a platform and stairway showing "Irving-Subway" metallic flooring and "Safstep." This product is being used today as walkways, platforms, galleries and floors in cotton mills, gins and power houses. The accompanying illustration shows the "Safstep," one of the articles which will be included in this practical exhibit. In attendance at this booth will be J. A. Moser, H. H. Schuldt and J. W. Madden.

STEIN, HALL & CO., INC., 61 Broadway, New York, will occupy sections 211 and 212 on the second floor. Included in the exhibit of this company will be a display of starch, gums, dextrines, etc., which are manufactured by them. They propose to feature in this display "Royal Tapioca Flour" which is the base of several of their products. The exhibit will be in charge of L. W. Peabody.

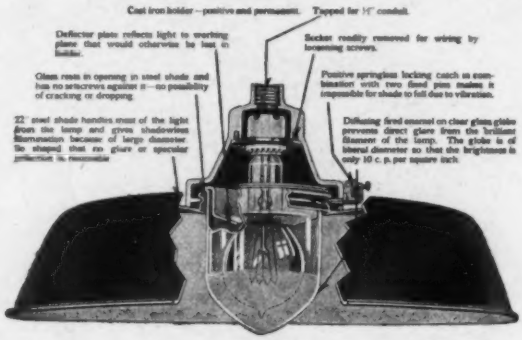
STANDARD GAS PRODUCTS COMPANY, formerly the Bird-Wilcox Company, with general offices at Harris & Ivy Sts., Atlanta, will utilize spaces 201 and 202. This company manufactures the well known Standard medium pressure welding and cutting machines for welding all broken parts of textile machinery. Over 350 textile mills are now equipped with this process. In this exhibitor's space will be displayed their latest types of welding and cutting equipment and accessories. They will not do any actual welding, but will only have a stationary display of their products. The man in charge of this exhibit will be H. A. Dale, sales manager, assisted by Marshall Hughes, superintendent of welding.

BAHAN TEXTILE MACHINERY COMPANY, manufacturers and selling agents for cotton mill specialties, Union, S. C., will occupy spaces 100 to 105 inclusive. They will show patent loom attachments and other patent textile machinery. William H. Bahan, Jr., president of this company, will probably attend and be in charge of this exhibit.

ALEXANDER BROTHERS, Philadelphia, makers of leather belting, etc., will utilize spaces 335, 336 and 337. We are advised that it is the decision of this company to have a graphic and complete exhibit of their entire line at the show. With this aim in view they are preparing three or four glass cabinets so made that they can safely ship this exhibit from one point of the country to another without

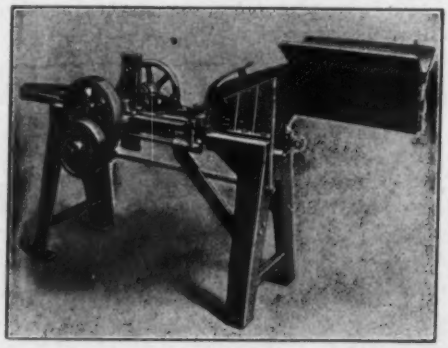
detriment. Representatives from the Philadelphia office will probably be in attendance and G. G. Slaughter, southern representative of the company, will probably spend a part of the week at this exhibit.

CENTRAL ELECTRIC COMPANY, Chicago, Ill., will exhibit in spaces 358, 359 and 360, showing special lighting equipment for the more difficult operations in textile mills, particularly in the weave rooms. A feature of this display will be a Maxolite diffuser, shown in the illustration herewith, which will be prominently demonstrated and shown in actual operation over a loom. This diffuser was designed


Cast iron holder—positive and permanent. Tapped for ½" conduit.
Deflector plate reflects light to working plane that would otherwise be lost in holder.
Sucker readily removed for wiring by loosening screws.
Glass rests in opening in steel shade and has no setscrews against it—no possibility of cracking or dropping.
Positive springless locking catch in combination with two fixed pins makes it impossible for shade to fall due to vibration.
22" steel shade handles most of the light from the lamp and gives shadowless illumination because of large diameter. So shaped that no glare or specular reflection is reasonable
Diffusing fired enamel on clear glass globe prevents direct glare from the brilliant filament of the lamp. The globe is of liberal diameter so that the brightness is only 10 c. p. per square inch.

to fill the demand for an industrial fixture which will have high efficiency and uniform light distribution combined with an intensive brilliancy so low that it will not unpleasantly affect the eye. This unit is made particularly for use with a 200-watt lamp, as this type of fixture, properly spaced so as to eliminate shadows and give uniformity, requires a 200-watt lamp to provide the desired amount of light. The exhibit of this company will be in charge of A. L. Arenberg, manager of the lighting division of the organization, and the following men from the lighting division will also be there: F. L. Warner, assistant manager; R. C. Close, assistant illuminating engineer; and A. G. Smith, sales engineer.

THE TERRELL MACHINE COMPANY, 10 East Fourth St., Charlotte, N. C., will occupy spaces 39 to 44 inclusive. They propose to feature in their exhibit the Utsman quill cleaning machine. In these spaces will probably be shown a single end type machine and a double end machine, the latter having about twice the capacity of the former. The



single type machine is constructed to clean about 80 quills a minute, giving a capacity of 160 quills a minute to the double end type. One of these machines is shown in the accompanying illustration. The exhibit will be in direct charge of E. A. Terrell, president and treasurer of the company, who will be assisted in the demonstration of the machines by O. L. Richardson.

SIMPLEX ROLL CALENDERING MACHINE COMPANY, Anniston, Ala., will have spaces 47 and 48 in which they will exhibit their roll calendering machine. This machine is specially designed and constructed to improve the drawing surface of leather covered rolls used in preparatory and spinning processes. It rolls and calenders the leather covered rolls between three highly-polished and true running steel rolls, two of which are heated from within by

radiation. The rolls are placed in the machine between the two heated steel rolls, the cold roll being used as a revolving weight, pressing the covered roll in close and true contact with the heated rolls and are calendered until sufficient polish is added to the leather surface. The upper roll automatically assists in smoothing out all imperfections in the leather. The result of this process is a smooth finish, high polish, great truth and cylindricity. This exhibit will be conducted by Walter L. Moss, of Anniston.

AMERICAN MOISTENING COMPANY, John Hancock Bldg., Boston, Mass., with southern office at Atlanta, will occupy spaces 172 and 173. They will display their high duty fan type humidifying head and atomizing type humidifier. They will also exhibit their automatic humidity controls and automatic heat controls. In connection with the high duty fan type head will be displayed a filtering tank showing the method used of filtering return water from this equipment, which is re-pumped to the heads, thereby furnishing pure water at all times for such operation. Fred C. Schaefer, southern agent of the company, will be in charge of this exhibit and will have associated with him C. A. Burgess, superintendent of installation, and his assistant, J. D. Johnson, and A. W. Harris and M. F. Guill, salesmen.

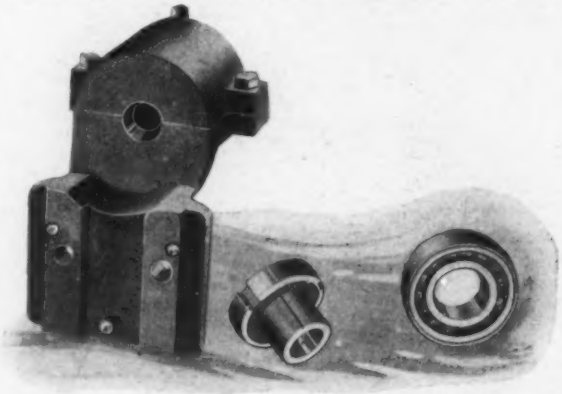
WESTINGHOUSE LAMP COMPANY of New York will exhibit in spaces 352 to 355 inclusive, a standard line of mazda incandescent lamps, such as are generally used for the illumination of textile mills. Among the special lamps to be shown will be the daylight mazda lamp (blue bulb) which is used for discrimination of color and the low and high power regular gas filled lamp for lighting large areas, together with porcelain enameled steel reflectors including the r. l. m. type that is very largely used for industrial lighting. One of the later developments in incandescent lamps, known as the mill type lamp, will be demonstrated on a device that will show that this lamp can withstand considerable vibration and abuse. The lamp will be bumped against a board with a force equivalent to a 10-inch ver-

tical drop, bringing to the attention of the delegates the ruggedness of this type of lamp which can be used in textile mills on portable cords where there may be considerable vibration and where the lamp may be subjected to frequent handling. A foot candle meter, an instrument for reading directly the amount of light on the working surface, will be shown and demonstrated. This instrument will enable the superintendent of a mill to see that his illumination values are being maintained and will aid him in establishing a maintenance system on his electric lighting. Various prominent mills and buildings that are using the Westinghouse mazda lamps to effect their illumination will be shown on brilliantly illuminated transparencies. In addition, there will be projected from lantern slides views of well illuminated interiors and also showing the process of lamp manufacture, through its various phases. Robert B. Ely, publicity representative of the New York office, will be in charge of the exhibit, and E. W. Snyder, district engineer covering the Carolinas, and E. P. Carpenter, district illuminating engineer, Atlanta office, will also be in attendance.

THE SCREW MACHINE PRODUCTS CORPORATION, with office and factory at Providence, R. I., will use spaces 35 and 36 to exhibit the Select-O-Phone automatic interior telephone and call system. This company will also install their service free of charge in the headquarters of the management of the exposition and also in the spaces of some of the principal exhibitors. This system, as indicated by the name, provides a means of interior plant communication, with an ultimate capacity of 33 direct lines and two extensions for each line. All of these are intercommunicating with each other. The call system is a service which will locate and provide verbal connection with a desired person anywhere in a plant. The accompanying cut shows the standard desk instrument. This exhibit will be in charge of H. P. Dixon, southern representative of the company.

DETROIT STEEL PRODUCTS COMPANY, Detroit, Michigan, will exhibit in space 258. They state that the primary object of their exhibit will be to show the large number of textile mills equipped with Fenestra steel sash. The second point to be stressed will be the promotion of their dual warehouse system, and the advantages this service offers to southern mills. For this purpose a large screen with two side panels, showing a map of the southern section, and giving the location of the company's warehouses, will be displayed. "Every dot a Fenestrated textile mill" is a self explanatory slogan and the dots on the map will indicate the location of Fenestra mill jobs. The two side panels will be devoted to a display of photographs of modern textile mills. In addition to the screen, a demonstration unit of sash, together with small samples, showing the finer points of steel sash construction, will be displayed. A booklet—"WindoWalls—Their Cost and Their Advantages" will be distributed together with other suitable literature. A. J. Campbell, of Birmingham, Ala., director of southern agencies, and J. Mac. Rabb, Greenville representative, will be in charge of the exhibit.

ALDRICH MACHINE WORKS, Greenwood, S. C., will exhibit in section 200. This display will consist of ball bearings and ball bearing boxes for application to various machines which are marketed by this company. A feature of this exhibit will be a ball bearing for the measuring rolls on slasher warpers. This is something recently placed on the market, and is attracting much attention. This type

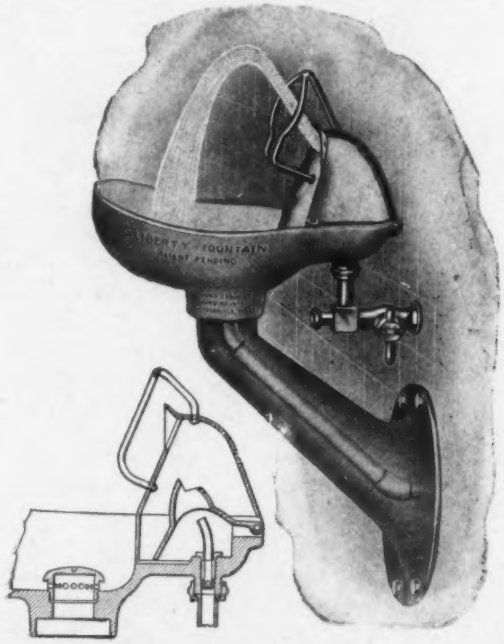


of bearing minimizes the friction drag on the measuring rolls so that the yarn slippage is reduced, and the run-outs at the slasher are much better. Savings of from one to five pounds of waste per set of beams is claimed for ball bearing equipped measuring rolls. The exhibit will be in charge of A. P. Aldrich, Jr., and it is likely that Mr. White of the U. S. Ball Bearing Manufacturing Company will also be in attendance.

DRAPER CORPORATION, Hopedale, Mass., with southern office at 188 South Forsyth St., Atlanta, have reserved the section on the first floor which includes spaces 3 to 16. They will exhibit four complete Northrop looms in operation. There will be: one 40-inch E model loom using their standard 8-inch bobbin, with filling battery, warp stop motion, etc.; one 36-inch K model loom arranged with Crompton & Knowles dobby, on fancy weave; one 36-inch E model loom using 8¾-inch extra large bobbin, on denim; one 36-inch P model loom for weaving medium duck. These looms will all be motor driven. There will also be incorporated in this exhibit samples of various smaller improvements and supplies, including Morrill patent slasher comb, Rhoades patent slasher comb, various types and sizes of spinning and twister spindles, MacColl patent spooler guides, improved Northrop and Lawrence guides, Northrop loom shuttles and bobbins several patterns of Dutcher temples and minor loom improvements. Those in attendance at this space will probably include Fred Forster, southern agent, assisted by several of his staff from Atlanta; Frank J. Dutcher, president, and other representatives of the company, from the main office and factory at Hopedale will also doubtless be present.

PURO SANITARY DRINKING FOUNTAIN CO., Haydenville, Mass., will use two spaces, 253 and 254, of Mr. Player's section for their exhibit. They will show their line of drinking fountains and water coolers. The new Liberty

fountain, manufactured by this company, is shown in the accompanying illustration. This model is designed for schools, restaurants, playgrounds, etc. It consists of an enameled bowl with nickel finished hood and face guard. Underneath is an additional shield to prevent any foreign substance or water falling back on the nozzle or jet. The flow of this fountain is cross bowl or side-stream flow onl , the shields preventing any sources of infection. This model is an attractive one in both design and finish. The illustration shows it mounted on a wall bracket, which permits its being mounted in a large number of different positions and places. It can also be furnished with cooler



or pedestal. This company also makes the Puro water cooler, which contains 40 feet of coiled galvanized pipe and holds 50 pounds of ice. The tank is double-walled with cork insert and the top is equipped with rubber gasket and locking device. Representatives of the company will doubtless assist Mr. Player at this exhibit where all will be invited to a cool drink of water served the Puro way.

NEW YORK & NEW JERSEY LUBRICANT CO., 401 Broadway, New York, have taken spaces 119 to 122 inclusive and will have on display grades of "Non-Fluid Oil," which have been developed especially for the textile industry, and are designed for lubricating every machine employed in the carding, spinning, twisting and weaving of cotton. These lubricants, it is stated, insure freedom from oil stains on goods in process, thereby stopping a loss which costs southern mills many hundreds of dollars each year. This company will distribute, gratis, a textbook on textile machinery lubrication, in which is illustrated every machine through which the cotton passes from the bale to the packing room and which treats of the lubricating difficulties usually experienced and the remedies for them. The exhibit will be in charge of the company's well known southern district manager, Lewis W. Thomason, and there will also be in attendance men who have specialized on the lubrication of textile machinery, and are amply qualified to give mill superintendents and engineers expert advice on this subject and recommend lubricants for each machine that will insure its working at the lowest operating expense.

SACO-LOWELL SHOPS, Newton Upper Falls, Mass., have taken spaces 87 to 94 inclusive in which they will probably have in operation some of the textile machinery which they manufacture. Rogers W. Davis, southern agent, Charlotte, and Walter W. Gayle, from the Greenville office, and others will be among those in attendance at this exhibit.

ATLANTIC DRIER & VARNISH COMPANY, Meadow & Wolf Sts., Philadelphia, who manufacture "Takitof" paint and varnish remover, will be located in space 203 with a line of their products on demonstration.

SOUTHERN COTTON OIL COMPANY, through its Paint Department at Savannah, Ga., will exhibit in spaces 298 to 300 inclusive. The accompanying illustration shows the display of this company, which will show the paint products manufactured by them. This company has been manufacturing paints since 1907 and, it is stated, considerable success has attended this division of its business; the policy of this department has been to produce materials of the highest quality, and to sell them direct to the user. Three products are made for all wood surfaces, under the names of "Scoco" efficiency paint, "Scoco" house colors and "Scoco" heavy service paint. "Cotton White," another product, is made especialy for the cotton mill trade and will

be featured at the exhibit. Dado paints are especially made for interior wood, brick, concrete, plaster or metal surfaces. There is also made a line of engine and machinery enamels, varnishes and floor paints. Experts of this company having made a study of textile needs and conditions, the products for this field are based on practical experience and knowledge. All paint products of the Southern Cotton Oil Company are made in the Savannah factory, from raw materials. Considerable work is being done along research and formulating lines and the company is well equipped to furnish paint for any special requirements. R. R. Hampton and H. S. Rockwell will have charge of the exhibit.

SOUTHERN STATES SUPPLY COMPANY, Columbia, S. C., will exhibit, in spaces 96 to 99, their line of mill supplies and specialties in charge of suitable representatives.

GREENVILLE BELTING COMPANY, Greenville, S. C., will use spaces 369 and 370 for a display of their products adaptable to textile mill use.

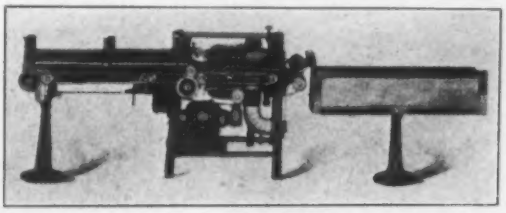
Lockwood, Greene & Company, Engineers, Boston, Atlanta and Charlotte, will utilize spaces 313, 314 and 315, showing a number of large water-colored perspectives of buildings being completed this year by this organization. The buildings to be shown will include the new mill for the Winnsboro (S. C.) Mills; knitting mill and dye house for P. H. Hanes Knitting Company, Winston-Salem, N. C.; mercerizing plant for the Dixie Mercerizing Co., Chattanooga, Tenn.; knitting mill and dye plant for the Holston Manufacturing Co., Knoxville, Tenn.; mill for manufacture of denims for the Miller Cotton Mills, Waco, Texas; weave shed, Columbus (Ga.) Manufacturing Co.; community house for LaGrange (Ga.) Mills. These pictures will be in mahogany frames and placed on a partitioned background of green fabric and lighted with individual picture lights, the whole presenting an attractive and artistic appearance. Harry S. Roberts of the Atlanta office will have charge of the exhibit and other members from this office and the Charlotte office will be on hand during the week to greet their friends.

The National Ring Traveler Company, Providence, R. I., will have a display of their products in space 371 which has been reserved by them.

Mountain City Foundry & Machine Works, Greenville, S. C., have reserved spaces 294 and 295 where representatives of this organization will be on hand to greet the visitors to this exhibit.

Cotton, Atlanta, Ga., has made its usual reservations and will be located in spaces 367 and 368, where representatives will be glad to meet the friends and customers of this magazine who are invited to make use of the facilities and equipment at this booth. Among those who will be in attendance at this space are L. L. Arnold, editor; W. J. Rooke, business manager; R. W. Philip, associate editor; M. C. Stephens and Fred Abendschoen.

Atlanta Harness & Reed Manufacturing Co., Atlanta, Ga., have reserved space 158 wherein they will demonstrate their reed cleaning and polishing machine. This machine is designed to clean reeds, to remove all rust, grease or starch from between the splits, and to smooth up all temple and shuttle marks. It is well known that good weaving cannot be accomplished without clean, smooth reeds and that it is expensive and unsatisfactory



to clean and polish reeds by hand or to send them out for this operation. Consequently thousands of reeds are discarded on account of abrasions such as shuttle marks, temple marks and other scratches. It is stated that constant use of this machine will keep these abrasions off, or at least rounded up until they will do no harm. Cotton and woolen reeds have the ribs thoroughly protected against having the paper polished off by the brushes. Revolving fine wire brushes clean and polish between the splits as well as on the surface, it is said. The machine is automatic, feeds reeds from a magazine, requires no attendant, and stops automatically when the last reed in the magazine has run through. All dirt is either collected in dirt receptacles or blown out of the mill as desired. The machine will be in actual operation at the exhibit. A representative from this company will be present at the Show, and it is probable that a representative of the Shawmut Engineering Company, of Boston, of which the Atlanta company is southern agent, will also attend.

Monarch Bobbin Cleaner Co., Union, S. C. will be located in spaces 346 to 348 inclusive, and will exhibit their products in charge of representatives of the company.

Enders Steel Products Co., 9 South Clinton St., Chicago, will be represented in space 50 with an exhibit of the products which they manufacture.

Corn Products Refining Co., 17 Battery Place, New York City, have, through their southern agency, the National Starch Co., Greenville, reserved spaces 309 to 312 inclusive. They purpose to exhibit their well known line of textile starches, thin boiling and thick boiling; dextrines and gums. These will include their lines adapted for warp sizing and finishing. John R. White, manager of the southern office, a recent photograph of whom is shown in the accompanying illustration, will be present at this exhibit. Also in attendance will be Albert G. Smith, of Atlanta; Harold Van Zandt, of Greenville, and Dr. W. R. Catheart, technical director of the mill and paper division of the company, of New York.

Crouse Hinds Co., Syracuse, N. Y., will use space 238. This company manufactures a line of electrical specialties for textile mill use and these specialties will be displayed and demonstrated at their exhibit by representatives of the company.

Seydel Manufacturing Company, Spartanburg, S. C., will be represented at space 274 and will have on hand an exhibit of the various sizing materials which they manufacture.

Park Manufacturing Company, Charlotte, N. C., will use space 66A where representatives will explain the advantages of the freight elevators manufactured by this company, one of which was furnished the textile building by the manufacturers.

Oakley Chemical Company, 22 Thames St., New York City, will display in spaces 106 and 107 a line of their chemicals for textile mill use.

H. K. Ferguson, 6523 Euclid Ave., Cleveland, Ohio, will be represented in space 292.

U. S. Ring Traveler Company, Providence, R. I., have reserved spaces 326 and 327 in which will be displayed a line of their products, with representatives of the company in charge.

Textile Industrial Institute, Spartanburg, S. C., have had spaces 82 to 86 inclusive reserved for their use. This organization fosters the Model Mill in which "Character" cloth, samples of which will doubtless be displayed at the exhibit, is manufactured. Rev. D. E. Camak, president of the institute, will be in charge of this display.

F. J. COOLEDGE & SONS, Atlanta, will use space 340 to exhibit their line of textile mill paints, oil, glass, etc., and several men from the Atlanta office will doubtless be present.

CAMPBELL MANUFACTURING CO., Worcester, Mass., will exhibit in spaces 58 to 61 inclusive. It is stated that this exhibitor will display some new types of ball bearing top rolls and new cap bars on a spinning frame supplied by the Mason Machine Works. Representatives will be present to demonstrate these new features.

YARNALL PAINT CO., Philadelphia, Pa., will exhibit in space 328 with a line of their paints, oils, etc., for use in the textile industry.

U. S. GUTTA PERCHA PAINT COMPANY, Providence, R. I., will occupy space 206. It is stated that the chief article of interest at this exhibit will be "Barreled Sunlight," the Rice process mill white. The illustration depicts the trade mark of this product. At this exhibit will also be a quantity of advertising matter, samples, panels and liquid samples for trial purposes, a line of souvenirs and others matters of interest. The company's representative, J. S. Palmer, is to have charge of this booth. It is probable that other representatives from the Providence plant will be in attendance.

S. F. BOWSER & CO., INC., Fort Wayne, Ind., will use spaces 342 to 345 inclusive for a practical demonstration of their oil cabinets and oil handling apparatus especially designed for mill use.

REEVES PULLEY CO., Columbus, Ind., will have some of their products on demonstration in space 34.

THE FULTON COMPANY, Knoxville, Tenn., have reserved spaces 234 to 237 inclusive, and will show therein some of their automatic temperature control apparatus in charge of company representatives.

WILLIAM FIRTH, 200 Devonshire St., Boston, Mass., manufacturers of textile specialties, will utilize spaces 349 to 351 inclusive, for demonstrating some of their products.

FELT & TARRANT MANUFACTURING CO., 1713-1735 N. Pauline St., Chicago, Ill., have reserved spaces 175 and 176 and will have a practical display and demonstration of the Comptometer, which will probably be under the supervision of Walter E. Sloan.

DANA S. COURTNEY CO., Chicopee, Mass., will use spaces 144 to 146 inclusive for an exhibit of their bobbins and other textile specialties, the exhibit being attended by representatives of the company.

DETROIT GRAPHITE CO., Detroit, Mich., manufacturers of paints, interior and exterior, for cotton mills and houses or other buildings connected with the mills, will offer an exhibit of their products in spaces 365 and 366. This company manufacturers the well known "Sta-white," a high gloss interior mill paint. G. W. Cureton, the Greenville representative, will be in charge of this exhibit.

FIBRE SPECIALTY MANUFACTURING CO., Kennett Square, Pa., will exhibit in spaces 139 to 141 inclusive, with a line of their "Hercules" seamless roving cans, warehouse cars, and other fiber receptacles for textile mill use. Representatives will be in attendance.

As the forms on this section of the issue close there comes an additional list of exhibitors not mentioned previously in this story. As there was not sufficient time to secure descriptions of their respective exhibits, we append the names of these exhibitors together with the location of their spaces and the products they will probably display:

THE AEROSHADE COMPANY, Waukesha, Wis., spaces 546 and 547. Window shades.

AMERICAN TOOL COMPANY, Cincinnati, Ohio, space 222. Machine tools.

BUSSMAN MFG. CO., St. Louis, Mo., space 541. Electric fuses.

CAROLINA SUPPLY CO., Greenville, S. C., space 223. Mill supplies.

DEFORD COMPANY, Boston, Mass., space 540.

ECLIPSE MACHINE CO., Elmira, N. Y., spaces 527 and 528.

FOOTE & DAVIES CO., Atlanta, Ga., spaces 504 and 505. Office supplies.

W. F. FANCOURT & CO., Philadelphia, space 123. Soaps and softeners.

GEORGIA SCHOOL OF TECHNOLOGY, Atlanta, Ga., space 506. Products of textile department.

GRAVER CORPORATION, East Chicago, Ind., space 533. Tanks and filters.

JUDSON MILLS, Greenville, S. C., spaces 409, 411 and 415. Fine textile fabrics.

KEMPSMITH MANUFACTURING CO., Cincinnati, Ohio, space 224. Milling machines.

H. F. LIVERMORE CO., Boston Mass., spaces 542 and 543. Loom supplies.

MINTER HOMES COMPANY, Greenville, S. C., 36 by 30 foot space, center stage. Fabricated houses.

MONROE CALCULATING MACHINE CO., Orange, N. J., spaces 531 and 532. Calculating machines.

NEW BRUNSWICK CHEMICAL CO., New York City, space 545. Softeners.

ODELL MILL SUPPLY CO., Greensboro, N. C., space 330. Mill supplies.

PITTSBURGH PLATE GLASS CO., Atlanta, Ga., space 536 to 539 inclusive. Paints.

SAFETY FIRST MANUFACTURING CO., Alexandria, Va., space 344. Shaft couplings and collars.

WARE SHOALS MANUFACTURING CO., Ware Shoals, S. C., space 416. Textiles.

WILLIAM J. NILES CO., Philadelphia, space 507. Paints.

T. B. WOODS SONS CO., Chambersburg, Pa., spaces 345, 347 and 348. Transmission equipment.

YADKIN FINISHING CO., Lexington, N. C., space 403. Finished textile fabrics.

The Industrial Problem*

BY ERNEST MARTIN HOPKINS.†

There recently appeared in the columns of the "Dearborn Independent" over the signature of Henry Ford, a quip to this effect—that a woman putting a baby to sleep was ten times more attractive than a woman putting an audience to sleep, to which Don Marquis made reply in the columns of "The Evening Sun" to the effect that he could testify from personal experience that the one who has responsibility for putting a baby to sleep has a ten times harder job than he who puts an audience to sleep; unless the audience happens to be teething.

I have appropriated this bit of facetiousness for this evening because it has been my fortune within the last three months to travel thousands of miles about the country and to see group after group in widely separated cities, and I am as firmly convinced as I am of anything in the world that American audiences were never teething to a greater extent than they are at the present time. And the ring upon which they are biting is the query as to why in this great, progressive and intelligent country of unparalleled opportunities we find the problem of extricating ourselves from the maelstrom of war conditions so difficult and sometimes seemingly so impossible. It is essential that we come to certain fundamental considerations and certain fundamental convictions as a ground work even for the discussion of this subject, to say nothing about trying to arrive at any conclusion in regard to it!

The war came like a lightning flash on a summer's night, and revealed not only the beauties of the things which we held dear in civilization, but it also revealed the wastage and all that was unattractive and disagreeable which lay about, to which we had been shutting our eyes listlessly for so long a period. We are now in a time when we are not so much meeting conditions which are a complete change or a complete reversal from what existed before, as we are among conditions which impose the necessity of meeting an accelerated evolution, and within the period of a comparatively brief time we are having to solve hundreds and thousands of problems which under ordinary circumstances we could have had leisure probably to deal with during the next few decades.

We have been cognizant of the fact for a long period that it was necessary accurately to calculate and to estimate the forces of stress and strain upon material substances if we were to be safe in the use of these, and, yet with the analogy before us and with all the progress that has been made in evolving these mathematical formulae, it seems to have been only comparatively recently that there has been any consciousness in the human mind that civilization was subject to stress and strains which could be calculated if we could devise the social equations and if we could codify facts sufficiently to draw up the formulae by which to judge to what extent society could bear the pressure of contemporary conditions and if we could evolve the reckoning to know wherein and how to meet the strains that are put upon life today.

Gerald Stanley Lee said in his book "Crowds" that he thought that the time was coming soon when we would no longer say to men "Be good" but "Be intelligent," because except as men are intelligent they cannot ultimately be good. I think in something the same way, in the interpretation which we put upon science, we have a right to say that science is not true science except as it devotes itself to the welfare of mankind and is utilized for the great constructive purposes of civilization rather than those which are destructive.

In the evolution of science, we have to be on our guard not only against those things which would subtract from the benefit which science might be, but also against those things which would detract from the accuracy with which it could be applied. And I think that, perhaps, one of the most fatal things to the scientific spirit is the closed mind. The favorite figure for all times of the philosophers in regard to closed-mindedness has been blindness. William James wrote one of his greatest essays on "A Certain Blindness in Human Beings," and the particular figure in regard to blindness which seems to me, perhaps, most important of all is the statement of Seneca in regard to his wife's fool who was blind, in which Seneca said that the tragedy of the fool's blindness was not that she was blind, but that she therefore thought all the world was black. In some such way those of you who have to do with industrial management, those of you who have to do with trying to convince people who are not interested in the desirability, or necessity, of new methods which shall carry them on to an advanced technique and the opportunities of increased production, realize that one of the most fatal things which we have in the industrial situation is that certain blindness; the blindness of the limited intellect in a man who has come to industrial power, which renders it impossible for him to see and makes him think that all the world is black outside the range of what his limited vision covers.

If we should go back nearly 1,000 years from the present period, we would find all western Europe in ferment. We would find communities which had scarcely had access to or inter-communication with communities a few miles away, ill at ease and the resident youth in unrest. And we would eventually see, under the impulse of the religious incentive which led men into the crusades, the youth of western Europe arising and responding to this religious impulse and migrating down across Europe into the seacoast cities of Italy, whence we would see them embarking and going to the Orient to wage a religious war.

The point I want to emphasize in this is that all history shows that the reaction from war has been of the kind and largely in proportion to the motive which led to the war. There are surprising parallelisms likewise between the crusades and the great transmigration of the recent war.

To begin with, the youth of western Europe, as I said, went to the seacoast cities of Italy to embark. The seacoast cities rapidly became seaports. A merchant marine was built. The men were transported. A system of finance which became international was devised. So the invading

*Extracts from an address before the Taylor Society at Rochester, N. Y.

†President of Dartmouth College.

hosts were taken from Italy, but it was not profitable to bring back the empty ships and thus there was brought back into Europe the learning of the Orient, the customs of the Orient, and even the diet of the Orient. Even in small details, the changes in civilization were almost beyond calculation, as for instance to the tables of Europe, which had known hardly any variety in diet, there were brought the spices and the sweets and the fruits of the Orient. And to the individuals were brought the change in fabrics of clothing and the change in styles, the silks and satins.

But more important than all these, there was brought that great accumulation of educational material, that great store of educational narrative of the past. The classics were brought in; and what had been the period of intellectual darkness in Europe, became transformed to a dawning period of intellectual light. Men began to study and to think and to query. Then, brought back into that state of stimulated intellectual activity, there came in time the returning hosts from the crusades; men who had been detached from their accustomed tasks, men who had been separated from all that they before had held conventional and prescribed. And they came back with agnosticism and with cynicism, and with the query of "Why?" on all lips.

Out of this there sprang eventually the greater intellectual revival, and in time the Protestant Reformation, not only of great advantage to the world, but perhaps the greatest single advantage that ever came to the Roman Catholic Church, because out of the Protestant revival there came that great religious and intellectual challenge which made for a betterment of all conditions, within or without the Church.

Thus we have the absolutism of the Church overthrown, which was the strongest and most powerful absolutism that the world had ever known, overthrown by the natural reaction of a series of wars which had been stimulated on the basis of a religious impulse. But absolutism has a way of not disappearing, but of shifting from support to support and the Church having unloaded absolutism, it settled upon the shoulders of the State, and the Statecraft of the next few centuries became the absolutism of the time; and the greatest political absolutism that it was possible to devise.

Then, hastily skipping over the centuries, we come to the wars of the 18th century, which were political wars, were wars for the political supremacy and the enhancement of States; and the French Revolution came with its momentous consequences. And the motive which had led to the wars in its turn bred the reaction in kind and in quantity, and we had the beginning of the democratization of the State.

Again absolutism passed—not out of the world, but onto the shoulders of a new power which was arising, the economic power. This power, beginning with the industrial revolution can be sketchily described as follows: there was the development of the machine. There was the development of power. Machines were then centralized around the power, and we had the beginning of the factory system and later factory design, with all that followed in their train in the matters of planning and routing, etc., and scientific management; and then within the memories of all of us, the attention to personnel.

We are entering into a period when intelligent scientific management cannot be imagined which doesn't recognize that the source and very essence of the whole proposition in regard to the development of industry here in the United States resides in the incentive which can be afforded to the individual worker and the interest which can be aroused in production.

We have had this great war, out of which we are just trying to extricate ourselves. Fundamentally it was an economic war. The blockades were an economic weapon. The devastated areas were an economic weapon. The submarine was an economic weapon. As somebody has said, the armies were but the mailed fists with which the warring nations struck. The strength of the war and the resources of the war were back in the shops and in the industries of the individual countries.

We had millions of men detached from the circumstances into which they had grown and where inertia had been holding them with hardly a question and they went abroad. There under new conditions they thought in new terms and they were brought into contact with new customs and now people. There was an intellectual stimulation in the whole procedure. And eventually they came back into this United States of America with very much less of a disposition to accept what society arbitrarily deals out to them without any consideration on their part, and they have come back with the determination to live their individual lives to a degree such as never was within the determination of peoples before.

Thus we are brought down to the final fact, that the absolutism of the economic power is shattered; and just as the absolutism of the Church, just as the absolutism of the State, now the absolutism of this new power is gone, and we come to the proposition squarely that the whole history of authority and power, if we analyze it, has been that it flows from the few to the many; and that having flowed from the few to the many, it is never restored to the few. Under those circumstances, it is no longer a debatable question as to whether we will operate economically and industrially on the theory of absolutism; but we come down to the proposition pure and simple that cooperation and mutualism, which have been found inevitable in other walks of life, which have been the result of the reactions of other impulses in previous wars, must be paramount and must be recognized to a degree that they never have been recognized before.

Democracy would be a very deadening thing if out of this we were justified in drawing the conclusion that there was to be one great level of population, one great level of intelligence, one great level of wealth; and I have never been able to see anything that was plausible or attractive in the socialistic theory that subscribes to anything approximating this proposition. I believe that we are coming to a time when the assertions of the Declaration of Independence must have an entirely new meaning to us because they must mean that every individual shall have the opportunity, so far as it can be afforded, of developing to his maximum capacity, in other words, the well-known scientific management principle—that every resource shall be used to its maximum effect.

Somebody says: "But hasn't that been so?" The answer is "No." I have talked with employers occasionally who said they thought in the large that it had been so.

But I challenge anybody to go into some of the great mills, or into some of the great shops of this country, and to find any evidence whatsoever that there has until very recent times been any such importance attached to the individual welfare of the man or the woman worker as there has been attached to the mechanical equipment, or the great sources of power, or even the structures within which the work was done. After all, we have had some such proposition as this: that the tools which were originally owned in the craft guild period by the individual man, that the house in which the individual man worked and trained in his apprentice, his apprentice desiring to create an article that should be an advance on that of his master—we have come to a period when instead of the ownership of those tools and those houses the ownership has constantly become restricted, because it hasn't been possible for any except those with financial resources of increasing magnitude to control the tools by which industry was to be developed.

Parenthetically, I would state that I am not saying this critically because I am not at all sure that the industrial revolution could have been utilized or could have been carried through as it has been carried through, or perhaps have become profitable to society at all, unless there had been a period when attention should have been concentrated as it was concentrated; and when those who were able to gain command of the sources of production should have gained command of them and have developed them with a compact and quickly available supply of financial resources.

However, we have come to a time when the speed of the machine is not the only criterion of what the individual workman should do, but when opportunity for self-expression must be given to the individual workman as in no time in the past. We have, in short, come to that period when we must make the distinction which Emerson makes in one of his essays between the man working and the worker, because if you put a thousand machines into a plant and you bring in a thousand men and train them simply to a standardized running of those machines to maximum capacity, you have ceased to have a thousand individuals there, but you have come to have a class, a quota made up of a thousand impersonal units out of which a dozen or a hundred can drop to be replaced by others who shall do the same standardized thing. And it is necessary, therefore, if we are going to get the increased production which it is necessary that we should have, if the prosperity of the world is to be enhanced, it is necessary that we should put back into industry somehow the stimulus and the incentive to work on the part of the individual.

It seems to me that it is a question which ought not to need to be argued in a group like this, that production has never yet been increased by legislative enactment; that industry has never yet been increased by legal injunction; that production has never yet been increased to any extent by evangelistic oratory. But production, when it has been increased, has been increased by making the agencies or the tools of industry more effective and up-to-date. The advance in production has been secured by making the mechanical equipment and the organization of that more effective.

But we have come to the limit, I believe, of that except as that is carried on hand in hand at the present time with the development and the encouragement of the individual worker, which give him a sense of responsibility and give him a stimulation to work, which shall make him desire to work because of his understanding that economic wealth is created day by day and does not exist as a great reservoir, somewhere.

I believe that education has a tremendous responsibility in this whole matter, and I don't mean by that the education simply which is given within the formal walls of an institution, but I mean the education which comes from a general desire, bred in the minds of the public at large, that everybody's intellectuality shall be widened and deepened and made more powerful; and if it were possible for us at the present day to get into the minds of men everywhere the fundamental fact that wealth isn't a great store which can be drawn on indefinitely without exhaustion, but that wealth is that which day by day is created by the individual hands and the individual minds of the workers, I believe under those circumstances there are few in the country who would be so perverse as to wish not to meet their responsibility.

And so we come to this question as to how, if at all, there can be put into the minds of men the desire to work and to the question whether there is the possibility in the disordered state of the present civilization of accomplishing anything in this way. The only answer that one can make in response to an interrogation like that is to point to experiment after experiment, success after success, all over the country, where they have taken down the barriers, where men have ceased to view work as an unpleasant job but have begun to look at work as something which interests them and their part of which they understand. For it is one of the accepted propositions at the present time, somewhat accepted at least and necessary to be accepted much more widely that the production of the world is going on against the distinct disinclination of the productive force to produce; that, as a matter of fact, the job, instead of being something which is done for the enjoyment of it, is something which is done in order that the means may be found for self-expression in some outside manner.

We ask, how are we to get rid of this incessant demand for higher wages? How are we to get rid of this insistent demand for lower hours? But just as sure as can be, we are never going to get rid of these so long as work is something distasteful and is deliberately made unpleasant, something entirely devoid of interest; and when the only opportunity for self-expression comes within the hours and the activities outside the working period.

We have, I believe, simply these two options: if industry must be maintained on the present basis, then we must plan constantly to be met with the recurrent demand that hours be shortened and that pay be increased. Or, we have the opportunity, on the other side, to inject back into industry something of the opportunity for self-expression, the development of one's personality, so that the man shall understand his responsibility in the economic world and shall have some joy in meeting it.

During the war a friend of mine wrote to me, saying: "If anybody would tell me why I am boring a hole in a piece of steel 150 times a day, I would go at my work

with a spirit such as I have never had before." And then he continued: "I don't know whether this piece of steel goes into a machine to make a ship, into a ship itself, or whether it is put into a ship to take abroad, or whether something else is done with it. And when somebody asks me what I am doing in the war, I haven't the faintest idea and I can't find out."

I went not long ago into a factory where they were making metal implements. A man was stamping out a little triangular piece of steel and I said to him: "What are you doing with that?" "I don't know." "Where does this come from?" "I don't know." "Where does it go to?" "I don't know. The only thing I know about it is I have to get out so many hundred an hour."

The superintendent of that plant on being told of this said that he was going to undertake to find out how many men there were in the place who were in a like situation. I told him that if he had my experience he would find out that practically all of them were. He started through the plant and he came back and he said: "We are going to begin a development course right away, and we are going to have these men understand everything from the incoming of the raw materials clear up to the sales policies," and I recently heard that it was being carried out with fine effect.

There is another plant, in many ways a model plant within this country, and yet each day groups of a dozen or fifteen or twenty visitors are taken through by guides and are shown this process and that process, and are told the whole aim of the industrial establishment. And one of the men in that establishment said to me: "Why is it that all these people who don't work for this company can find out all of these things and none of us who work for it can?" Later, that company installed a system by which their men could find out, and they took groups of their own workers and went with them clear back to the raw materials. They showed them where the raw materials came in, took them through the plants and showed them the processes and showed each individual man where his function came in, and when the process was completed, they took them up and set them down in the sales offices, where they had one of the sales managers come in and talk to them just as though they were salesmen going out on the road. The company told them what the economic place of this proposition was, what the economic need of the product was and why it was sold and where it went, and the advantages which the company argued would come to the world at large if every man, woman and child used the product.

The outcome was that the men and women in that plant went back to their work with an entirely new attitude toward, and enthusiasm for, what they were doing.

I was told less than six weeks ago, up in the Northwest, of a lumber operator who had a strike the circumstances of which, I understand, have been written up in one of the popular weeklies. This man, for the first time in years of operating, recently found labor trouble within his ranks. He found his men going out one day and he asked them what was the matter, and the men said: "We are on to you. We know all about it at last." He said: "Just what is this that you are on to?" It then developed that they had been told by some who had come among them with the intention of forming an outlaw organization among them that the proprietor received sixty dollars a day on each man's work, and that he was paying on an average only six dollars a day, whereat the men said: "We deserve a bigger share of this."

The man said to his employees: "You come back with me, on my time," and they went back. He put up a roll of wrapping paper on the wall and began and went through every process, every accounting process from the beginning to the end of the manufactured product. And when he had finished, he was able to show them exactly what his comparatively small percentage of profit was on the individual man's work. And out of that whole proposition there came an unprecedented contentment within, according to the operator himself. He was quoted to me as saying he had never had such good conditions, and of adding, "Believe me, from now on I am not going to spend my time so much explaining our cost accounting to the banks from which I am borrowing money, but I am going to spend it in enlightening our own workers and interesting them in what is done."

These are small details, but they, nevertheless, represent some of the necessities under which the industries of America are at the present time; that they shall, instead of continuing to subtract responsibility from the individual workers, begin to throw responsibility on them; that instead of considering the attempt to express personality and to show initiative a handicap for which a man should be disciplined or discharged, they shall consider such attributes as an asset and shall see that the man is given his opportunity to work out what can be worked out on that basis.

The matter of shop committees, the matter of labor organizations, the matter of many similar things, is in the last analysis the simple desire on the part of the individual to feel himself a part of the business. I have been in labor meeting after labor meeting, where I have been perfectly sure that most of the speeches made were not made nearly so much from any innate weakness in the mechanical process in the plant, as because of a weakness in the company attitude toward its personnel, which made the individual man just simply bursting with a desire to express himself somewhere, and being unable to express it in the plant, he went outside to express it—and often expressed it in destructive terms designed to work against the prosperity of that very thing on which he himself was dependent for his own welfare in the end.

It is a perfectly normal human impulse, and it is an impulse that has got to be recognized. And with a body politic such as is ours in the United States at the present day, it is inevitable that we should have more of that until we devote ourselves to the particular phase of the industrial dilemma which has denied so much to the individual worker which must be restored to him before we can ever hope to begin even the solution of the difficulties now disturbing us.

Over across the river from the little northern New England town in which Dartmouth College is located, there is the Vermont village of Norwich where, in former days, a winter course of entertainments made the local church a Mecca for the Dartmouth undergraduate body. One of our most respected graduates tells the story that, in those days when still there was a strong feeling in Hanover against the influence of the stage, in this neighboring

village a panorama was advertised of scenes from Pilgrims' Progress. The redeeming feature of this particular drama was that it was to be presented in the church; and its ethical value being thereby guaranteed, no question was raised about its helpful influence, upon the Dartmouth students who thereupon flocked to it *en masse*. It is to be presumed that within the little church, lighted by kerosene lights and furnished only with an inadequate stage, the necessary mechanical equipment could not have been provided for presenting the panorama with that effect which might have been possible under other conditions. At any rate, toward the close the slides seemed to move across the stage slowly, and only upon the expenditure of great and noisy effort, even though concealed. The final scene was announced as the grand transformation introducing a view of the Land of Beulah over the shoulders of the delectable mountains. For the sake of the desired illusion, the slide was shoved forward quickly, even anticipating the complete disappearance of the preceding picture, the giant Despair. The heavy canvas moved a short way across the stage, giving only a glimpse of the Promised Land and then came to an abrupt stop. Then there was a great creaking and groaning of tackle and equipment from behind the scenes and an expectant hush in front of them, when all of a sudden the raucous voice of one of the employees was heard exclaiming in exasperation: "The damned thing won't go without greasing. I can't get Beulah Land on."

The point which I wish to make in closing is that just as the audience was expecting to view the disappearance of the giant Despair and to see the Promised Land over the shoulder of the delectable mountains, without participation or effort, so in these days too many expect the machinery of life to run smoothly and think that the correction of all common ills will be made by some obscure group in which they have no responsibility and no part. The American people at the present moment are very eager to see the last of the representation of the giant Despair and are excitedly demanding that this slide be replaced by a view of some happy land easily discernible over mountains that shall prove to be surmounted with comparative ease. The accomplishment is not impossible but it demands truer knowledge than we have had of some of the mechanisms of life and a wider participation and cooperation than has heretofore been prevalent. For such a group as this, participation in the effort and contribution to the final outcome is possible in a very important way. But even in the large, for those of us who are more detached from the particular problems, there is at least the possibility of intelligent and sympathetic cooperation rather than ignorance and indifference. In short, the organization of civilization needs to become far more inclusive than it has ever been for those to whom no opportunity is given to set up the scenes or to work the mechanism, there is at least the opportunity for filling oil cans and applying lubricants that will bring on the Promised Land the quicker because of a little greasing.

Man was made for growth. It is the object, the explanation, of his being. To have an ambition to grow larger and broader every day, to push the horizon of ignorance a little further away, to become a little richer in knowledge, a little wiser, and more of a man—that is an ambition worth while.—Marden.

Japanese-American Trade Relations.

Japanese competition in our domestic markets does not menace American industry, the National Bank of Commerce in New York declares in the September issue of its magazine, Commerce Monthly. On the other hand an examination of the trade of Japan with the United States since 1914 emphasizes the important economic relationship between the two countries and, according to the bank, indicates the desirability of maintaining satisfactory mutual trade relations between them.

"The first factor is distance. Yokohama is 4,536 nautical miles from San Francisco, 9,699 miles from New York via the Panama Canal, and 8,414 statute miles by water and rail route via San Francisco. Freight charges are not a large item in the case of articles the value of which is high in relation to weight, but it is obvious that the distance makes Japanese competition a negligible factor in the heavier classes of commodities which the United States is fitted to produce either by reason of natural resources or the character of the labor supply. It is true that Japanese competition is a much more important factor on the Pacific coast than on the Atlantic seaboard, but it is likewise true that about 90 per cent of the population of the United States, and hence approximately the same percentage of purchasing power, is east of Denver, so that the relatively more advantageous position of Japan on the Pacific coast is not to be regarded as constituting a serious threat to American industry.

"The second factor by which the competitive ability of the Japanese is to be measured is the relative labor cost. In recent years, however, great changes have taken place in the labor situation in Japan. Prices have risen even more rapidly than in the United States. Wages of necessity have advanced to meet the increased cost of living. Moreover, Japanese labor is slowly growing out of its passive orientalism and the standard of living is rising. Although it is probable that the efficiency of Japanese labor is improving as a result of changing conditions, the gain has not yet been great enough to offset the increased money cost which has taken place. American manufacturers, therefore, should not be at any marked disadvantage as far as sales in the United States are concerned.

"Unmanufactured cotton, is, year in and year out, the principal single commodity exported from the United States to Japan. British India and China are the other chief sources of supply. Exports of American cotton to Japan have grown from 323,202 bales in the fiscal year 1900 to 881,041 bales in the calendar year 1919. Domestic production of cotton is unimportant, but the Japanese are endeavoring to increase cotton growing in Chosen, and with Japanese capital in China. The tendency of the Japanese cotton manufacturers to produce finer counts of yarn as well as higher grades of cotton piece goods seems to point to an increasing reliance upon the importation of American cotton in the future. It is clear, however, that an extensive use of American cotton would enable the Japanese to specialize in the better grades of cloth to the probable detriment of British and American trade throughout the Orient."

You can purchase a man's labor, but you must cultivate his good will.

Diphenyl Black Printing

BY WILLIAM B. NANSON.

Diphenyl black was first introduced by the Farbwerke, Meister Lucius & Bruning in 1901. It is, in many respects, similar to aniline black. It consists of the oxidation products of various amines, but, unlike aniline black it does not tender the fabric, neither does it turn green, and it can be steamed for an hour with perfect safety without damage to surrounding colors that may be printed with it on the same goods.

Diphenyl black is found in the market as "Diphenyl black base" and "Diphenyl black oil D. O." both of which are used for printing—the former for steam styles of the most delicate description and the latter for more ordinary black and white effects.

Diphenyl base and oil are soluble in acetic acid or acetin. The oil D. O. is a solution of p-amidodephenylamine in aniline oil; the base is p-amidodephenylamine by itself. The solution of these bodies in the ordinary acids is possible, but the salts so formed are too insoluble to be used in printing.

The oxidizing agent used in printing is, in most cases, chlorate of soda; aluminum chlorate may also be used, but it is not so convenient. As an oxygen carrier the salts of copper are the best. Ferrocynide of potassium throws the base out of solution, and vanadium salts act too quickly. Cerium chloride is also a good oxygen carrier and is used along with sulphide of copper. Other additions to the color paste are lactic acid, aluminum chloride, and the necessary thickening materials.

After printing, the goods are aged in the "steam ager" for one to three minutes, then steamed for an hour or more if printed with alizarin or basic colors and finally washed and soaped in a slightly alkaline bath. This black is, moreover, ungreenable without chroming, which is not good for it, as it imparts a brown tone to the black and injures it.

There are many ways of printing diphenyl black but the following recipes given by the patentees of the color will serve as types.

Diphenyl black—(1) 1,100 grams of starch; 4,500 water; 1,080 acetic acid 9° Tw.; 200 olive oil. Boil, shut off steam, and add 300 chlorate of soda; cool off and add a solution of 350 diphenyl black base 1; 1,300 acetic acid 9° Tw.; 450 lactic acid 50 per cent; just before using add further 100 copper sulphide paste, 30 per cent; 300 water; 180 aluminum chloride 52° Tw.; 140 cerium chloride 84° Tw. This black may be used with alizarin and basic colors. After printing it is a light grey in color and must not be over dried. It is fully developed by a two or three minutes' passage through the rapid ager at as high a temperature as possible. Then if the pattens contain "steam colors" the goods are further steamed for 1 to 1½ hours, with or without pressure, fixed in tartar emetic for the basic colors, and finally soaped.

For ordinary work (i. e. single blacks and styles commonly associated with aniline black) the following recipe, which contains some aniline may be used:

Diphenyl Black.—(2) 1,100 grams starch; 5,315 water; 1,125 acetic acid 9° Tw.; 200 olive oil. Boil, cool a little and add 300 chlorate of soda. Cool and add a solution of 225 lactic acid, 50 per cent; 123 hydrochloric acid 28° Tw.; 67 water; 500 diphenyl black oil D. O. Just before using add 200 copper sulphide, 30 per cent; 63 water; 215 aluminum chloride 52° Tw.

Print on unoiled cloth, dry gently, age 2 to 3 minutes at 95° C and then pass at once into an alkaline soap solution at 60 to 80° C; or, if printed with iron buff, through a hot solution of caustic soda.

Blacks obtained from diphenyl black base 1 are more expensive than aniline blacks, but they are safer, because they do not give off any injurious acid vapors or gases during steaming and they are absolutely ungreenable and do not require any after treatment with bichrome to fully develop them, moreover, they do not tender the fiber nor injure any of the other printed colors with which they may be associated.

But, on the other hand, it may be said that from an economical standpoint the diphenyl black oil D. O. can be used with advantage, because, though its initial cost is greater, a good black can be obtained with as little as 4 per cent (on the weight of the printing color), whereas at least 8 per cent of aniline salt is required to produce an equally full shade, and, as a rule, not less than 9 per cent is used.

Diphenyl black oil, D. O., containing, as it does, a certain amount of aniline, possesses properties intermediate between those of pure aniline and pure diphenyl black base 1, so that as regards to resistance to greening influences it is superior to aniline. Its effect on sensitive steam colors is also much less pronounced, because, in the black prepared from diphenyl there is less mineral acid, and no metallic salts to act injuriously on other colors. Aniline blacks, however, are simpler in composition and are more easily prepared. They are, we think, also more reliable in action, and better for finely engraved patterns, where their use is possible, not only on account of their cheapness but because they are more reliable and give a fuller and deeper black. For fine patterns the diphenyl blacks require to have their strength very materially increased and this makes them too expensive for many of the "black cover" styles.

I may say, however, that the diphenyl blacks are superior to the aniline blacks for general "steam" work and they certainly give the finest all round fast black on cloth prepared with naphtholate of soda for the dyeing of the azo colors like para-nitraniline, etc. For this purpose aniline black, pure and simple, is useless. It might be possible, therefore, that diphenyl black could replace both logwood and aniline for most steam styles, but owing to the fact that it is turned brown by bichromate of potash, it it not likely that aniline will lose any of its importance in the production of those styles which depend upon "chroming" for the development of their colors such as chrome yellow, steam prussian blue, manganese brown, cotechu, etc., all of which are being used at the present time in combination with aniline black.

Diphenyl Black Dyeing.

As compared with aniline black, diphenyl black is

ungreenable, and there is no danger of its tendering the fiber. For three reasons it is especially suitable for the dyeing of goods that have to be "Schreiner-calendered." This black is produced on the goods by the oxidation of either diphenyl black base, or diphenyl oil D. O., this latter being merely a solution of the base in aniline oil. Goods which have been padded with diphenyl black base may be taken direct over the regular drying cylinders as shown in Fig. 1, but it is better to pass them after drying through the rapid ager. After being aged the goods are rinsed and soaped. It is not necessary to boil the goods before dyeing, and chroming after aging or drying it is positively harmful as it turns the shade brown.

Dyeing Yarns.

When dyeing yarns the following two solutions must be prepared separately:

(1) 350 grams diphenyl black base are dissolved (warm) in 1500 c.c. acetic acid 9° Tw., and 400 c.c. lactic acid (50 per cent). The mixture is cooled and stored into 1 kilo, gum tragacanth thickening (6:100) and 2 litres of water, and made up with water to 5 kilos.

(2) 170 c.c. aluminum chloride 53° Tw., and 100 c.c. cerium chloride 91° Tw., are mixed with 3850 c.c water and 250 grams sodium chlorate dissolved in 750 c.c. of water and the whole made up to 5 kilos with water. 3 litres of (1) are mixed with 3 litres of (2) immediately before

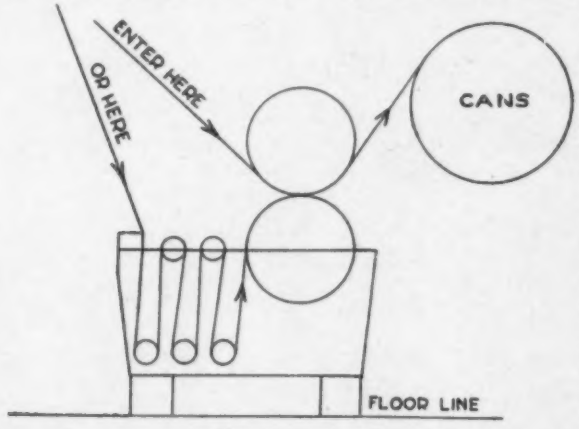


FIG. 1

using; 2 pounds of yarn are dyed at a time and thoroughly wrung and dried at 60° C. It is best to dry the yarn on a centrifugal drying machine to get level results. After the yarn is dried it should be steamed for 5 or 10 minutes without pressure, wash and soap.

Dyeing Piecegoods.

For dyeing piecegoods the goods are padded on a padding machine similar to the one shown in Fig. 1, and the padding liquor is made as follows:

(1) 6 pounds of gum tragacanth thickening (1:10) and 7½ pounds water. 4 pounds of diphenyl black base are dissolved (warm) in 5 pounds of lactic acid (50 per cent) and 13 pounds acetic acid, 40 per cent. Stir the tragacanth into it and add 14½ pounds of water so as to bring the mix up to weigh 50 pounds.

(2) 2½ pounds aluminum chloride 53° Tw., 2½ pounds chromium chloride 53° Tw., 6.4 ounces copper chloride 77° Tw., and 34½ pounds of water; then add 3 pounds sodium chlorate dissolved in 6 pounds boiling water and one pound oil of turpentine and dilute with water to 100 pounds. Mix 1 and 2 immediately before using. The tragacanth thickening gives homogenity and assists penetration and the turpentine prevents the mixture from frothing or foaming in the padding color box. After padding the goods are dried at 140° F., aged on the rapid ager for 5 to 10 minutes, washed and soaped.

When diphenyl black oil is used the mode of procedure is as follows:

(1) 6 pounds gum tragacanth thickening (1:10), 7½ pounds water, 6 pounds dyphenyl black base D. O. are dissolved cold in 15 pounds acetic acid (40 per cent), stirred into the tragacanth and made up with 15½ pounds of water to 50 pounds.

(2) 30½ pounds water, 3.8 pounds hydrochloric acid 30.5° Tw., 1.6 pounds aluminum chloride 53° Tw., 2½ pounds chromium chloride 53° Tw., 6.4 ounces copper chloride 77° Tw., 1 pound oil of turpentine made up with water to 40 pounds.

(3) 3 pounds sodium chlorate, 7 pounds water. Just before using stir three and two into one. After padding the goods through the liquor 2 or 3 times they are dried aged for half an hour or put twice through the rapid ager, there steamed for 2 minutes, soaped at 140° F., rinsed and dried. Should the color be too blue, a little fustic or quercitron bark may be added to the soaping bath.

The Newport Chemical Works, Inc., is making a very considerable expansion of their plant in Passaic. For this purpose, they have acquired, in addition to the premises now occupied by them, all of the property bounded by River Drive, Paulison Avenue, Gregory Avenue and the Erie Railroad, with the exception of two small houses and the holdings of the Anderson Lumber Company. A contract has been awarded for the erection of two large buildings, which are the beginning of the modern plant that will eventually replace all of the present older buildings.

One of these buildings will be built along the Erie Railroad tracks, where, by means of a new railroad siding, all incoming materials can be received and warehoused.

The other building will be on River Drive and will provide commodious quarters for the warehousing and shipping of the finished product. These are to be modern structures in every particular, of brick, concrete and steel construction and will be, respectively, two and three stories high. They are to be equipped with the most up-to-date equipment for the handling of materials as well as facilities for the comfort of the employees.

The ultimate program provides for other buildings which will communicate with these two and which are to house the major operation of standardizing dyes and making them ready for use by the various textile mills. Later on, there will also be added new office buildings. A new and larger garage is also made necessary by reason of the fact that an addition of six large Packard trucks has recently been made to the company's fleet.

The company proposes to utilize the main buildings at the old Bleachery as a permanent, up-to-the-minute series of laboratories and practical dye houses, print works, etc., so that it can perform, on a small scale, all of the principal operations now conducted in the various mills of the textile, paper, leather and other industries which use their dyes.

The best thing is to avoid mistakes; the next best thing is to profit by them after they have been made.

The Necessity of Standards in the Relation Between Illumination and Output.*

BY WARD HARRISON.†

WARD HARRISON.

Artificial lighting is often judged as good or bad depending upon the degree wherein it differs from the daylight conditions to which we are accustomed. Granting for the time that such a basis of evaluation may be a reasonable one, it is of interest to investigate the most usual differences between daylight illumination of interiors and its substitute. The two most common points of difference are: first, lesser diffusion of light—that is, small sources of high brilliancy cause glare and objectionable shadows as contrasted with the large light-giving areas of low brightness, such as the windows; second, lesser quantity of illumination both on the work and on adjacent surfaces. Inferiority in respect to diffusion of light (glare) although almost universal, is unquestionably a matter of neglect or of misapprehension of the principles of illumination, for today well diffused light costs little if any more than the other variety. On the other hand the question of the quantity of light to be supplied is usually considered to be an economic one. True, a certain minimum illumination is necessary to provide against accident, and should be supplied without regard to cost, and for certain operations a considerably greater amount than this minimum may be required to conserve the vision of the employees. In passing it may be noted that both of these factors are now recognized in the industrial codes of several states.

On the other hand, the experience of those who have investigated the subject most thoroughly is that in the majority of industrial operations it is not either one of the foregoing factors, accident prevention or conservation of vision, which should finally fix the quantity of illumination to be supplied in a given case.

In examining the works of a watch we almost involuntarily move over toward the window, although the illumination at all points in the room may be far above that ordinarily required to prevent eye strain. *We find that we can see more with increased illumination.* An examination of the Snellen's Chart under two degrees of illumination, say one foot-candle and ten foot-candles[1], will serve to confirm this belief. Again, we all know that a late afternoon tennis match must stop long before the ball, stationary, has become invisible to the players. *More light is required when objects in motion are to be discerned, or conversely, one's quickness of vision depends upon the degree of illumination supplied.* Likewise, if, after an illumination has been reached under which we see both quickly and easily, the quantity of light is continually increased, it is reasonable to supose that we will eventually come to the point where there is too much light, and where our ability to see is actualy diminished thereby.

In reality, however, there is little likelihood of ever getting our general level of artificial illumination too high, particularly in view of the fact that average outdoor illumination on a cloudy day is something like 1,000 foot-candles (units of illumination) and that a snow field does not become uncomfortably bright until illuminated to perhaps 5,000 foot-candles. Artificial illumination in industrial plants usually falls between ½ and 10 foot-candles with a pronounced leaning in the direction of the smaller figure. Good indoor daylight is ordinarily considered to be not less than 15 foot-candles.

At this point the main thesis of this paper at once suggests itself. How far does it pay to go? How many foot-candles should be supplied for a given operation in order that it may be conducted most economically, taking into account both the cost of the lighting and the possible increase in production and decreases in cost of manufacture which results from the change in lighting? Such positive knowledge of the subject as there is now available may be expressed in a very few words.

First: Night shifts, or for that matter evening shofts are notoriously inefficient. Their production averages from 10 to 25 per cent less than that of day shifts. The difference is due, in part at least, to the inadequacy of the lighting ordinarily supplied.

Second: In plants averaging, say 100 square feet of floor space per employee the cost of good artificial lighting per foot-candle supplied is usually not in excess of 0.1 per cent of employees' remuneration during the period.

Third: It is the concensus of opinion that while good lighting, as well as all other hygenic conditions, is conducive to a willingness to do more work, the increased production resulting from improved illumination is not due chiefly to a stimulative effect, but principally to the elimination of those small losses of time, and aggravating interruptions in the work, which result from inadequate illumination.

Fourth: In all of the efficiency tests conducted to date the highest level of illumination investigated has invariably shown the greatest production and the greatest economy. In fact in the range considered, the relation of decreased production costs to total lighting costs is of the order of 10 to 1. Four such tests which were conducted in a thoroughly scientific manner under the supervision of W. A. Durgin show increases in production of 10 to 20 per cent resulting from better lighting.[2]

In addition to the Durgin tests noted, there have been several other less complete investigations in various industries which have also indicated substantial gains from the liberal employment of properly designed illumination. It is evident, however, that the imperative need of the art is for a far greater number of exhaustive tests covering many industries, tests which not only establish the range

1 The foot-candle meter is a small, portable instrument which measures illumination directly in foot-candles. Since the foot-candle is rapidly becoming recognized as the popular as well as the scientific measure of illumination, this meter is a very practical measuring instrument. Technical knowledge of photometry is not required in its use because the adjustment is simple and determinations are made without the assistance of mathematical calculations. The foot-candles of illumination at any place are indicated by the point where the spots on the foot-candle meter screen change from brighter than their background to darker.

*A paper presented at a meeting of the Taylor Society held at Rochester, N. Y.

†Illumination Engineer, Cleveland, O. Chairman Committee on Reciprocal Relations, Illuminating Engineering Societies.

2 A record of these tests was published in Electrical Review, Chicago, March 22, 1919.

over which illumination may be profitably increased for a given operation, but, which are also carried to such a point of extremely high illumination that an actual decrease in economy is recorded due to the increased production, if there is any, being insufficient to compensate for the added cost of the light. All of these needs seem so simple and so obvious that you are inclined to ask why hasn't all this been taken care of long ago. The answer is that those interested in the subject of scientific illumination have been men trained in designing better lighting systems, and in improving the efficiency of our lighting units. It is only through their efforts that artificial lighting comparable with daylight has become available and at a reasonable price. These men very properly look to those skilled in the science of management to cooperate with them in solving the second part of the problem; that is, in determining just what degree of illumination is desirable and profitable in a given industry. As Chairman of the Reciprocal Relations Committee of the Illuminating Engineering Society, I commend this subject to the serious consideration of the members of the Taylor Society, and assure you that if you see fit to inaugurate such tests in your own plants or in the plants of your clients, the Illuminating Engineering Society will be glad indeed to furnish you with the best technical advice on the design of the various lighting systems and the choice of equipment.

In an apendix to this paper there has been included a list of factors which have been found in previous tests to require particular attention.

APPENDIX.

1. The test should cover a considerable number of operators working in the test area, supplied with a uniform illumination.

2. A separate work sheet should be kept for each man.

3. The humidity of the atmosphere, the time of the year, the days of the week, and days before and after holidays should all be closely noted, as any of these may cause a variation in production.

4. There should be a number of different illumination steps employed in the test. It is preferable to start with the original system, and check back on this original system several times, as well as to check production at least two times at each level. A check should also be kept on the daylight production when possible.

5. The material supplied the men should be closely inspected.

6. It is desirable that a knowledge that test is under way be kept from the men when possible.

7. There should be a close supervision of the men at all times to see that they are all at work and to note any change in personnel.

8. There should be a close check on the material supplied the men as well as the power supply, in order to note any shut-down from either of these causes.

9. Objection from the workmen is liable to be experienced when changing the size of lamps and reflectors, but this can largely be overcome by making all changes over the week-end.

10. The foot-candle illumination should be measured at the beginning and end of the hours under consideration as well as at certain intermediate hours. Definite stations should be located for these readings.

Notes About Men You Know.

H. G. HEWELL has resigned as second hand in the card room at the Star Thread Mills, Athens, Ga., to accept a similar position with the Covington (Ga.) Cotton Mill.

W. GARY has resigned as assistant superintendent of Mill No. 2, Fulton Bag & Cotton Mills, Atlanta, Ga., and has been appointed general manager of Couch Mills, Inc., Banning, Ga.

W. N. BAGWELL, formerly of Dallas, Ga., succeeds Mr. Gary at the Fulton plant.

H. E. RUNGE has been appointed assistant superintendent at the Trion (Ga.) Mills. Mr. Runge is a graduate of the Texas A. & M. College.

ALONZO GREEN has been transferred from superintendent of the Payne plant of the Bibb Manufacturing Company to their No. 1 mill at Macon, Ga.

In these days of coal stringency and high prices, the mill with an undeveloped water power at its back door is hard to find, but with the rapid improvements in equipment for the generation and transmission of electrical energy the water power development may be twenty miles away and still be at the mill's back door. For this reason manufacturers are carefully scanning the landscape for possible opportunities for power development that may be turned to account in their own plants.

If you have had such thoughts in your mind and have also mentally picked an undeveloped power site, you will be interested in reading a new booklet entitled "Rivers in Harness", just published by J. E. Sirrine & Company, Greenville, S. C. It discusses and illustrates some similar propositions. It may be had for the asking.

Announcement has been made that Nye & Tredick Company, manufacturers of circular rib knitting machinery, 718-720 Cherry St., Philadelphia, have discontinued business and that repairs, parts, cylinders and dials, or complete machines, can be obtained from Trump Bros. Machine Co., Wilmington, Del. The needle stock of the discontinued company has been taken over by the Manufacturers Supplies Co., Cherry & Juniper Sts., Philadelphia, who are in a position to take care of any needle requirements for the Nye & Tredick machines.

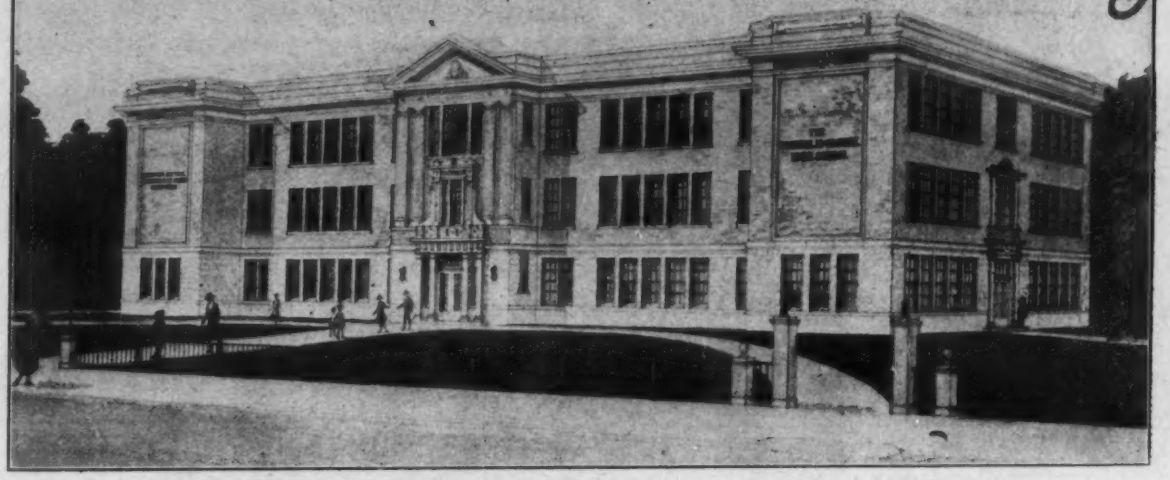
A new course has been added to the courses already given by the Textile Department of the State College which is the North Carolina Textile School. This new course will be known as the Textile Engineering Course and will make four courses offered by this department as follows:

1. Four year course in Textile Engineering.
2. Four year course in Textile Manufacturing.
3. Four year course in Textile Chemistry and Dyeing.
4. Two year course in Textile Manufacturing.

The same subjects are given in the Freshman year of all the four year courses and this enables a young man to select in his second year that branch of textiles he wishes to follow.

In the new Textile Engineering Course, students will take up engineering subjects in the Sophomore, Junior and Senior years, such as heat engines, power plants, motors, mechanics of materials, etc., together with other work in textile subjects.

What the SOUTHERN MILLS are Doing



The Leavelle McCampbell Highschool Buildi ng, Graniteville, S. C. Willis Irvin Architect.

When William Gregg, that venerable pioneer manufacturer of the South, established in 1845, at Graniteville, S. C., the Graniteville Manufacturing Company for the manufacture of cotton goods, it is doubtful that he expected that project to develop into an organization of the present size and activities of the company. What Graniteville has done, is doing and hopes to do, would beyond a doubt exceed the almost unbounded desires and aspirations of William Gregg when he began the organization three-quarters of a century ago.

This company has its main office and two of its mills at Graniteville, S. C. Another mill is located at Vaucluse, S. C., and the Warren Manufacturing Company at Warrenville, S. C. Its plants employ 1175 people.

The two mills at Graniteville are known as the Graniteville Mill and the Hickman Mill. The former, the oldest in the organization, was built in 1846, additional space being added in 1890. Its manufacturing equipment includes 87 cards, 25,160 ring spindles and 700 looms. Its power plant contains two water wheels. The plant is electrically driven with auxiliary steam power of 6 boilers.

The Hickman Mill is the newest of the four plants. It was built in 1900 and contains 73 cards, 2,400 ring spindles and 600 looms, is electrically driven and has steam auxiliary power of four boilers. This plant is equipped with a Cyclone steel mesh fence around its property.

The Vaucluse Mill, built in 1879-80, has 50 cards, 12,792 ring spindles, 394 looms, 1 water wheel, and is electrically driven with auxiliary steam power of 4 boilers. The site of this plant was purchased in 1878 from the Vaucluse Manufacturing Co. The original building was erected in 1832 and was destroyed by fire in 1878. This mill has the distinction of being the second cotton mill built in the South.

The Warren Mill is situated at the junction of the Columbia and Charleston Divisions of the Southern Railway in Warrenville, Akin County, S. C., and was built in 1898-99. The equipment includes 52 cards, 36,080 ring spindles, 1,000 narrow looms. The plant is driven electrically with steam auxiliary of 5 boilers.

The Mill at Warrenville.

The Graniteville Mill.

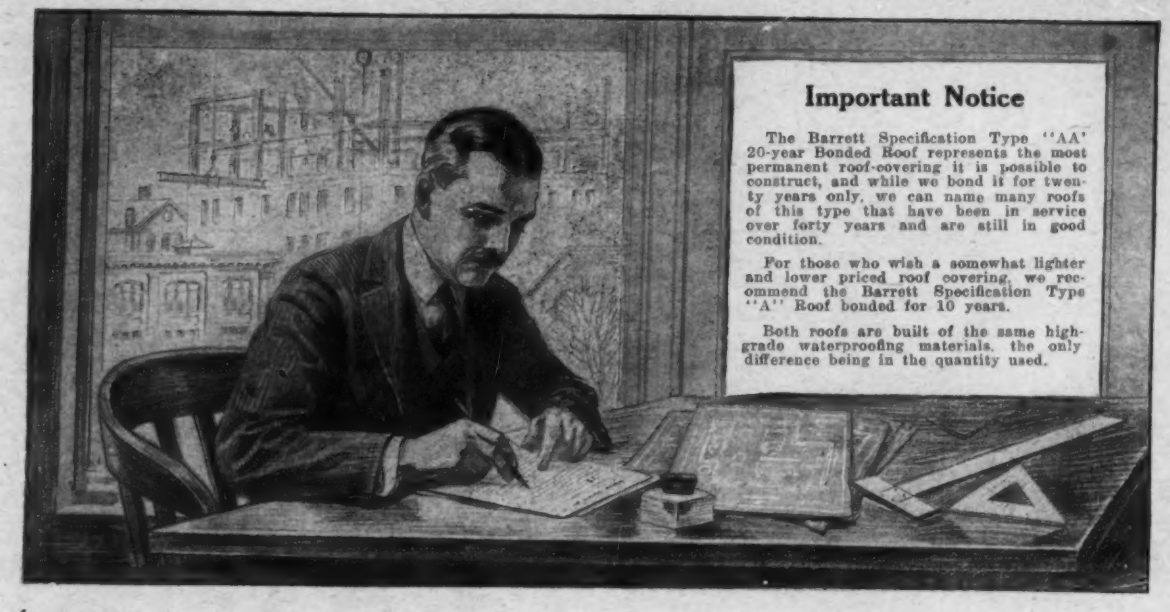
The products of the plants of the Graniteville Mfg. Company include sheetings, shirtings, drills and twills, and print cloths. Coles Phinizy, secretary and treasurer, is executive head of the four mills. George H. Leitner is general superintendent, assisted at Warrenville by Clarence S. Timmerman, at Vaucluse by G. E. Senn, and at Graniteville by J. Broadus Williams. The mills are in splendid shape and there is plenty of help. They are making good production, goods of fine quality, and with a small per cent of seconds. The maintenance of such a condition is no doubt contributed to by the general spirit of cooperation between the management and the help and a desire on everyone's part to do his utmost for the upbuilding of his town and community.

Graniteville is to have a new $125,000 school building, to be known as the Leavelle McCampbell High School. It is anticipated that the ground floor of this building will be equipped for textile instruction. This will probably be the first textile department to be installed in a mill school in the South. The second floor will be utilized for regular class rooms of which there will be fourteen.

The building is to be of three stories, the first of granite from local quarries and the other two stories of brick. It will be fire proof and be equipped with a modern lighting, ventilating and heating system. The third or top floor will be equipped with a large auditorium with a seating capacity of approximately 1,000 people. There will be a domestic science room, a manual training room, and laboratories. With the completion of the building it is proposed to install a domestic science teacher and an athletic director in addition to the twelve teachers now already utilized in the Graniteville schools. The old school building, in whose place the new structure will be erected, was equipped with spacious playgrounds and these will be utilized in connection with the new building. Willis Irvin, LaMar Building, Augusta, Ga., is the architect for the new high school building.

Last year's enrollment of high school pupils at Graniteville was 479, which is possibly the largest mill school enrollment in the State. Every year the colleges of South Carolina and other states enroll students from this school. It was to meet the increasing needs and to provide more adequate educational advantages, to carry out by one more step the unwritten policy of the company to provide good living conditions, healthful places of recreation and amusement, and every advantage to be offered in an educational and social way, that the Graniteville Company gave the contract for the new school building. The curriculum of the old school included ten grades, while in order to comply

The Vaucluse Mill.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The Definite Specification

From Editorial Page, American Architect, N. Y.

"THE physician who made a practice of prescribing certain drugs or others whose * * * * properties were similar"—would soon lose the confidence of his patients, and yet that is in effect what the architect is doing who persists in the outworn and discredited practice of writing 'or equal' after the specification of a given material. * * * *

"Unless he entirely neglects to perform his function and leaves the decision to the builder, he must sooner or later determine what is to be used and, considered both from the standpoint of the client's interest and his own reputation, it would seem to be desirable that he * * * * make his decision *when the specification is written* rather than *after the contract is let.*

"The old argument, * * * * that a definite specification fosters high prices, has been effectually disposed of by leading architects. * * * * It is evident that no manufacturer of standing and responsibility would take advantage of a definite specification to increase his price. To do so as a policy would be business suicide. * *

"If there is but one article or material that will, in the opinion of the architect, give better results than any other, he should have the moral courage to specify it outright."

with state high school requirements, the new school will have eleven grades.

Hickman Memorial Hall was built by the Graniteville Company in 1906. In this building is a library and reading room with bookcases and tables, and another room that is now being used for baby clinics and mothers' meetings. On the top floor is a large room or auditorium equipped with a stage and movable seats for entertainment purposes and also equipped for gymnasium purposes such as basket ball, indoor baseball, boxing, etc. Sets of Indian clubs and dumbbells, rings, horizontal bars, etc., are included in the equipment. In the basement of the building are separate bath rooms for men and women, equipped with hot and cold shower baths. Also a bowling alley, billiard table and swimming pool.

At the completion of the new high school building with its large auditorium, the Hickman Hall auditorium will be relieved of its uses for entertainment purposes so that it may be devoted entirely to its gymnasium features.

Realizing the value of public health service and the public health nurse—that "an ounce of prevention is worth a pound of cure"—the Graniteville Company maintains

Hickman Memorial Hall.

for its operatives a registered nurse, Miss Eva L. Mueller, a graduate of the Louisville (Ky.) City Hospital, whose office is in Hickman Hall. Included among Miss Mueller's duties are public health nursing, infant welfare work, home instruction in sanitation and hygiene, educational research work, etc. She visits among the homes in the villages, giving advice to mothers and also instructions on personal defects. In her crusade against disease she is filling a very vital part in the community welfare of these villages.

Under Miss Mueller's supervision baby clinics are held weekly at Hickman Hall at Graniteville and twice monthly at Warrenville and Vaucluse. Despite the fact that this feature of public health nursing has only been in operation a very short period Miss Mueller advises that at a recent baby clinic she found but 6 defectives out of 26 babies present. There are 4,000 people in the three villages which are served by two doctors. The public health nurse has already begun doing tubercular work and every school child was to be examined when they began the school term in September and again at the completion of the term.

The general trend of the public health service nurses is to use less medicine and more fresh air, sunshine and common sense. It has been found in many places where public health nursing has been adopted that a great deal

The Office Building at Graniteville.

of children's sickness has been due to improper feeding and it is usually the plan of these experienced nurses to cooperate with the domestic science teachers in teaching the mothers how to best prepare the food. The great secret of the whole proposition is to get the mothers interested in the personal welfare of their babies and to induce them to confide with the nurse on all their troubles.

After this, the rest follows as a natural consequence. The mothers will talk among themselves concerning the welfare of their respective children, many helpful sugges-

Miss Eva L. Mueller, the Nurse.

tions being derived from such conversations. The women who at first do not take an interest in the subject will either fall in line or become "wall flowers" at the various mothers' meetings.

It was planned by Miss Mueller to give a thirty-minute period each week to the girls in the 9th and 10th grades,

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giving instruction in home care, nursing and personal hygiene, upon the beginning of the present school term.

Characteristic of the public health nurse in industry, Miss Mueller believes that, within certain professional limitations, whatever she finds to do—that is her duty. One of her exploits is the conducting of illiterate classes among the operatives, which she states are very interesting. Miss Nona Senn instructed a class of mill people numbering 20 or more, three nights a week for twelve or more lessons, in the Vaucluse village. This class was recently concluded and the pupils are now able to write and read, enough for voting purposes at least, says Miss Mueller, who advises also that the adults in these classes are very eager to learn.

A literary club and a women's club for community betterment are included in Miss Mueller's plans. She also hopes to have installed in the library at Hickman Hall a "Baby Volume" for mothers. She is also enthusiastic over the possibility of securing a sanitary dairy for the especial benefit of the babies and young children.

Another prospective plan which Miss Mueller has in mind is the equipping of a teachers' recreation room in connection with the new school building, where the teachers may go for rest and comfort between sessions and have an opportunity to get better acquainted with each other. This room may also be used for the Parent-Teachers Association meetings.

Another plan that Miss Mueller anticipates adopting after the opening of the regular sessions of school is to secure a committee of mothers from the Parent-Teachers Association to serve noontime lunches at the school at cost. Each committee of mothers would serve for two weeks and then be replaced by another committee of mothers. Such lunches would naturally be of a light variety but would include such items as hot soup, hot chocolate and sanitary milk.

Gregg Park, the company's "playground" for its operatives, is situated in the heart of 14,000 acres of land, part of it well wooded and used exclusively as play ground and

GREGG PAVILION.

hunting and fishing reserve by the employees. There are four beautiful lakes in this reservation covering an area of over 700 acres.

Gregg Pavilion was this year completed in Gregg Park. This furnishes adequate facilities for bathing, boating and fishing. The lake on which it fronts has enclosed sand beaches for the children and women while outside the wooden railing is deep water for good swimmers and divers. The pavilion has a sanitary bubbler for ice water in the downstairs portion of the building. The bathing houses

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are located in wings of the pavilion, the ladies' lockers being on one wing and the lockers for men on the other wing. There are nine ladies' lockers built to accommodate three persons each and eight lockers for men built to accommodate four persons each. An equipment for shower baths is being installed in another part of the pavilion. Two separate rooms are set aside in the first floor of the pavilion under the care of the pavilion manager. In one of these rooms ice cream, candy and soft drinks may be purchased, the other room is a bathing suit renting department where operatives and their friends who do not own suits may rent one for 25 cents.

A $10,000 ice plant was recently completed by the company. This plant is equipped with a five-ton, motor-driven, Arctic ice machine and has a cold storage room attached. It has a gasoline auxiliary drive in order to keep the plant in operation in case anything gets out of order with the electric current. The ice is delivered to the consumer in any size piece desired at the rate of 50 cents a hundred pounds.

The water for the mill village and ice plant is secured from the famous Busbee Spring, a large natural spring in the vicinity, which is inspected by Dr. F. L. Parker, the state chemist, every thirty days for its purity. It does not require distillation for ice making purposes.

Graniteville has a good brass band, a boys' drum and bugle corps, and a very good baseball team. They also have a number of fraternal orders. Every year the Knights of Pythias give a real, old-time barbecue, on Independence Day, which is held in conjunction with the company's annual outing, at which the mill acts as host to its employees and their friends.

The Victor-Monaghan Mills, Greenville, S. C., have recently opened a laundry for their operatives and office force, where the weekly family wash will be done at a rate of 6 cents per pound. The string of eight Victor-Monaghan Mills now have four laundries, representing an outlay of $75,000.

The Brookside Mills, Knoxville, Tenn., have contracted for $400,000 worth of additional equipment and buildings. A new building 300 feet long by 200 feet wide, two stories high with first story concrete and second story brick, will be erected. The building will be used as a weave room. Also included in this construction work will be a tunnel, 600 feet long, under the creek and railway tracks for drainage purposes.

A Weave Room Interior, Hickman Mill.

The Banning Cotton Mills Company has organized and has purchased the plant of the Hutcheson Manufacturing Co., at Banning, Ga. George Beveridge and A. G. Couch, both of Atlanta, are president and secretary, respectively, of the new organization.

The Dacotah Cotton Mills, Lexington, N.C., will install 4,224 spindles and 150 looms in the addition which they recently constructed.

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OE-512

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TORONTO

PW-310

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the full force of the readjustment has been felt. Many of them are sanguine of the election of a Republican president, and in this section that means a return to better tariff conditions and relief from many of the radical theories and practices that have crept into political conditions under the guise of reforms in the past few years.

While no immediate attack upon labor is contemplated there is no doubt that the operatives have begun to see the end of their reign as dictators of manufacturing conditions. In some centers the desire for work has already made it possible to see a change toward an efficient operation of plants that have been more or less disorganized for two or three years. Many manufacturers say that if the operatives would work as well as they can they would favor trying to maintain the current wage scales well into the coming summer. The wage period expires on the first of December.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, September 18th, 1920.

Returns to the government, as of August 25th., indicated a yield of 12,783,000 bales vs. 12,519,000 on July 25th. linters not included. Until recently climatic conditions were unfavorable, too much rain, and damage by insects, principally by boll weevil and bollworms, has increased. These conditions are reflected in less favorable semi-monthly crop accounts. Returns for the half month to the National Ginners' Association indicated a deterioration of 3 points, to the Southern Products Co. a loss of 8½ points, and to the American Cotton Association a reduction in condition of 10 points. Present indications are that the deterioration from August 25th, to Sept. 25th will be the greatest for the past ten years, during which period the deterioration ranged from 1.3 points to 8.4 points, averaging 5.4 points. It is likely therefore, that the October Bureau report will promise a smaller crop, perhaps much smaller, than was forecasted September 1st when the probable production was placed at 12,783,000 bales exclusive of linters.

For the very first time, the government during the past week reported the appearance of weevil in North Carolina, the pest now infesting every cotton growing state, and it is likely that within the next year or two North Carolina will have suffered from weevil as has the rest of the belt. This year weevils are doing considerable damage in all infested areas, now doing much harm in South Carolina, although they have been there but a year or two.

With the exception of last year, ginnings to Sept. 1st were the lightest in ten years,—367,000 bales vs. 143,000 last year and 1,038,000 year before last, of which Texas contributed 344,000 vs. 39,000 one year ago and 752,000 in 1918.

Of late the market has ruled remarkably steady considering the better weather of the past week and outside general conditions, which are considered unsatisfactory. The real unsatisfactory condition in the whole situation, however, is that crop accounts are generally unsatisfactory, as a result there is improvement in the spot demand, and more business is reported in cotton goods.

Notwithstanding all the talk of heavy curtailment by mills last month, returns to the Census Bureau showed consumption during August in the United States to have 483,000 bales of lint cotton against 497,000 for the corresponding month last year, of linters 36,000 bales vs. 22,000, making total for the month the same as last year—519,000 bales.

Compared with last year, American mill stocks at the close of August were 1,131,000 compared with 1,133,000, and stocks in public storage in America were 1,968,000 against 1,817,000, making total stock in the United States August 31st 3,099,000 vs. 2,950,000. It is obvious, therefore, that the trade has to depend mainly upon the growing crop for this season's requirements, or until another crop is made.

Of the world's visible supply, there is in Europe and afloat of American cotton 982,000 bales against 1,227,000 last year, of which Liverpool is credited with 588,000 vs. 671,000 one year ago.

Spinners, American and foreign, have been keeping out of the market as much as possible in an effort to depress the price of the raw product, but the point has been reached whereby necessity will likely compel them to buy more freely in the near future for requirements.

Germany is coming to the front as an important importer of American cotton again, shipments from the U. S. to that country during August exceeding exports to the United Kingdom for the first time in the history of the trade. Exports to Germany last month were 46,000 bales vs. 22,000 last year, to the British Isles only 44,000 vs. 239,000. Last season Germany imported 443,000 bales of American cotton. By waiting, England has much to buy this season.

New Factory for Powers Regulator Co.

As The Powers Regulator Company of Chicago move into their new fireproof factory building, with its 40,000 square feet of floor space for manufacturing and office purposes, it is interesting to look back over the achievements of the past 30 years. Beginning in 1890 in a small room 12 by 16 feet in size, W. P. Powers, the founder and president of the company, built the first House regulators made in Chicago. By 1893 the business had so increased as to require 4,000 square feet of floor space, the "plant" having been moved several times in the interim. About 15 years ago they purchased the building where the first humble start had been made, using about 8,000 feet of floor space and renting the balance. During the last seven or eight years they developed their line of specialties, requiring more and more room for satisfactory production until the new factory became an indispensable necessity. This story of continuous progress is one of which President Powers may justly feel proud.

A low priced direct brown has recently been placed on the market by the Newport Chemical Works, Inc., under the name of Newport Direct Brown GXR. It is of an orange tone and is finding much favor as the base for tans in hosiery, it being of the correct fastness for that purpose, as well as a good union on half silk materials. Subsequent aftertreatment with copper sulphate produces a rich deep brown with splendid resistance to light and washing.

Crop Regulation as a Factor in Cotton Control

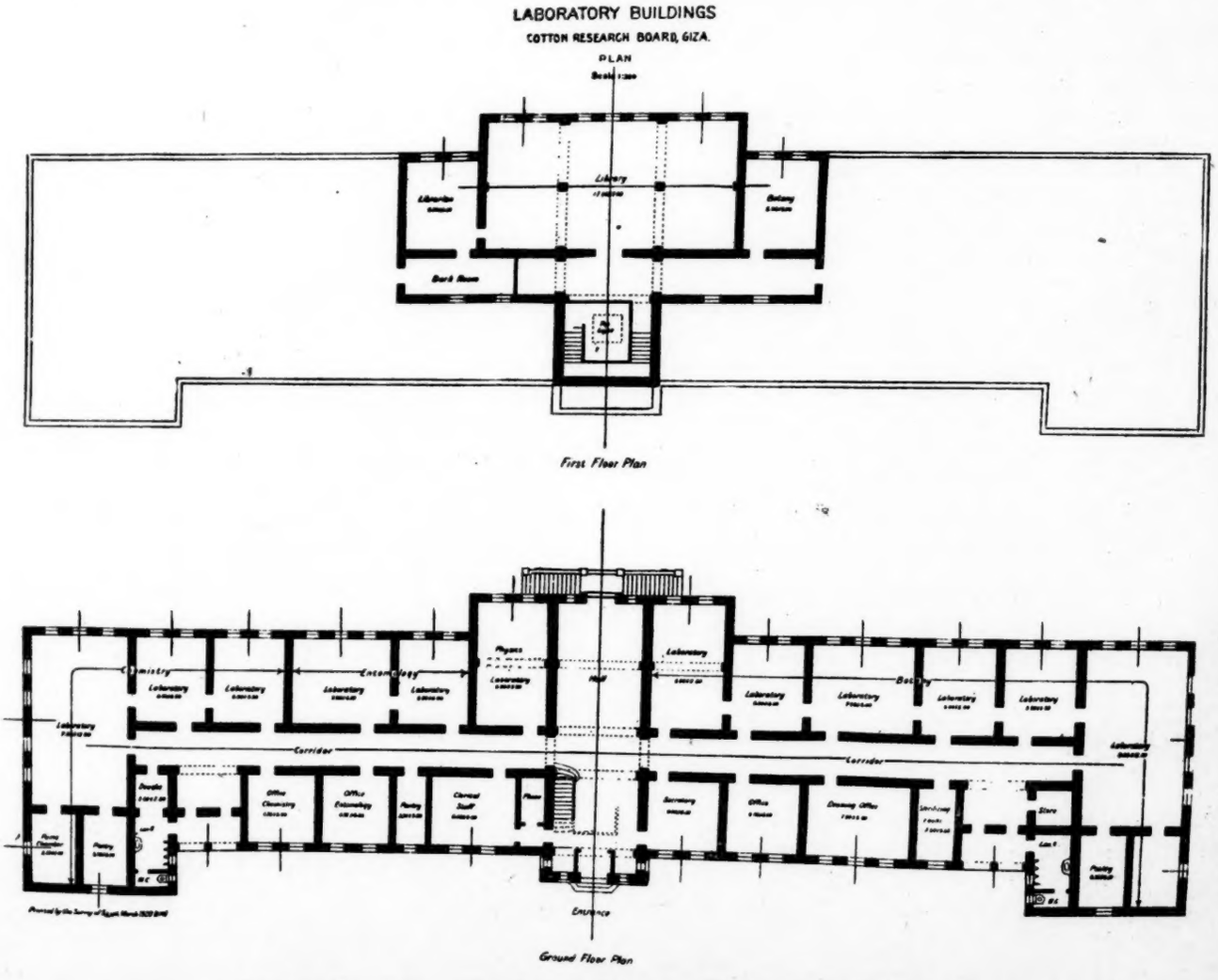
BY D. E. DOUTY, Chairman,
PRELIMINARY COMMITTEE ON AMERICAN COTTON RESEARCH.

There is a general feeling among the leaders in the world's great cotton industry, who think in international terms, that the world supply of raw cotton will not be sufficient to meet the world's demands for cotton products and that immediate steps should be taken to expand, increase and improve cotton production in all countries suited to cotton growing.

There have appeared recently in our southern districts a few men high in the councils of the growers and distributors of raw cotton who in the face of this evident world shortage of raw materials, advocate the favorable curtailment of America's production. This curtailment and group control of production does not appear to have as its fundamental purpose the strengthening and up-building of the southern farmers by developing a variety and rotation of crops, but the limitation in production and distribution for the purpose of maintaining prices.

During this readjustment period in our national industrial and agricultural life, it is perfectly clear that the cotton planter and distributor is confronted with the same difficult problem, as are all other industries, of taking a readjustment in the prices of his product downward in the face of high labor and supplies costs, which, on account of the unusual economic conditions appear, and probably will continue for several years, to lag behind in the downward readjustment. He, in common with all the other enterprises stimulated by the war, has taken his war profits in terms of an inflated currency, and it is perfectly natural that he should avail himself of every means at his control to avoid incurring losses during the period of national, industrial and currency deflation.

Is bureaucratic, governmental or self-imposed curtailment of production and distribution of the American cotton crop the proper method of protecting the cotton grower and distributor in the downward trend of world prices? It is an economic question subject to the usual processes of economic analysis and practical, every-day business guesses, the latter of which are often more successful in predicting solutions of commercial problems than the more academic methods of scholarly economists. No man, or



Laboratory Buildings, Cotton Research Board, Giza, Egypt.

group of men, should be hastily condemned for advancing theories of economic procedure, even though radical, provided all controlling factors and final results have been carefully considered and properly applied, and provided under such conditions no weaknesses can be found in either the hypotheses or methods of reasoning.

Where a complete or even controlling monopoly exists, there is no doubt that prices can be maintained by centralized authority, provided there is no governmental interference.

The American raw cotton industry enjoys a controlling position and the organization of the industry would make possible the exercise of tremendous power in the world's cotton markets.

Before the American cotton growers and distributors embark upon such a colossal enterprise or even encourage its serious public consideration, it will be wise to weigh with greatest care the present difficulties and the future dangers.

Market monopolies or corners are veritable commercial powder magazines which, like the lighted fuse, once started must continue to a disastrous conclusion and usually wreck every one connected with them.

In proposing plans for the curtailment of production and control of distribution in order to maintain prices, the American raw cotton industry is trifling with world economic forces of immense power against which it might temporarily succeed but beneath whose weight it will ultimately be crushed.

There are vast territories of the earth's surface which are by all natural characteristics, such as soil, climate and population, admirably adapted to raw cotton production.

Just as the urgent industrial needs of recent years have lead men to find ways and develop methods of growing valuable cotton in the arid valleys of Arizona, so will the pressure of economic suppression drive men and governments to find methods of growing cotton on the vast agricultural areas of other countries.

With the sole purpose of bringing to the attention of some of our American producers, distributors and manufacturers movements which are under way to increase raw cotton production in other countries, the following abstract is published from the Report of the Board of Cotton Research of Egypt.

Preliminary Report.

"In the character of its climate and of its soil, in its highly developed irrigation system and its large and industrious agricultural population, Egypt enjoys conditions particularly favorable to the cultivation of cotton.

"When it is added that the characteristic types of cotton which have been evolved in Egypt combine a high yield with a quality unsurpassed by that of any other cotton grown in considerable quantity, it will be appreciated that cotton is a crop of more than ordinary importance to Egypt. It is not surprising, therefore, that from the time when the possibilities of Egypt as a considerable cotton-producing country were first fully realized, which dated from the stimulus given to cotton-growing by the high prices ruling in the period of the American civil war, there was an almost continuous expansion of the area under cotton up to the point which was reached a good many years ago, where further appreciable expansion was practically impossible without the extension of the cultivable area of Egypt. Cotton, in fact, has been for long the dominant factor in Egyptian agriculture, and the prosperity of Egypt is bound up, in a particularly intimate manner, with the success of the cotton crop.

"The Egyptian Government has recognized the unique importance of cotton to Egypt by appointing commissions, from time to time, to study particular matters affecting its welfare, but for some time the need has been felt of a permanent organization for conducting research into all matters relating to the cultivation of cotton, and, on the conclusion of the war, steps were taken to meet this want by the establishment of a Cotton Research Board. In view of the interest aroused in this country and abroad by the creation of this Board, it seems desirable to issue a preliminary report giving a brief account of its objects and of what it has so far been able to accomplish.

"Past experience has shown the disadvantages attaching to the investigation of cotton problems from the point of view of any one branch of science, however eminent the investigator and whatever the range of his experience in his own particular subject, and the Board was primarily constituted to bring together experienced workers in those various branches of science which are intimately connected with agriculture (botany, entomology, chemistry, and physics), and so form a body whose duty would be to initiate and direct scientific research into all matters connected with the cultivation of the cotton plant.

"In the Journal Officiel of May 19, 1919, an order appeared constituting a Cotton Research Board 'to combine, cooperate, and extend research of cotton.' At the same time, the Ministry of Agriculture published an explanatory note in which it was pointed out that 'it is of the greatest economic importance to Egypt that every possible step should be taken to maintain the quantity of cotton which can be grown from each feddan (about 1¼ acre) of land. This may be increased or reduced by good or bad cultivation, use of good or bad seed, good or bad methods of watering, and by successful efforts to fight the pests of cotton, such as the cotton worm and boll worm.'

"The first meeting of the Board was held on May 31, 1919. After certain points of constitution and policy had been discussed, the necessity of finding laboratory accommodation at an early date was agreed to. As no suitable accommodation was obtainable, the Board decided to build. A site was then selected at Giza, and the plans were prepared by the State Buildings Department. These plans were approved, and on August 27, 1919, the Council of Ministers granted a sum of $125,000 for the erection of the laboratories. At the present time this building is advancing rapidly towards completion, and it is hoped that it will be ready for occupation in June next.

"In addition to the members of the Board, a large number of special scientific workers will be necessary to carry out the laboratory and field work already planned. A great deal of assistance will also be required from the officials of the Ministry of Agriculture and of the State Domains Administration in carrying out the Board's programme of work. The technical staff is as follows:

Botanical Section	Non-Egyptian.....	6
	Egyptian	12
Entomological Section ..	Non-Egyptian.....	2

	Egyptian	4
Chemical Section	Non-Egyptian.....	2
	Egyptian	2
Physical Section	Non-Egyptian.....	1
	Egyptian	2

"With reference to the non-Egyptian staff, three have already been appointed, and three other posts have been allotted, but have not yet been filled. The remaining five posts have been asked for, but are not yet sanctioned.

"Up to the present fifteen meetings have been held, and the field experiments enumerated are being carried out in different localities. These experiments are:

1. The effect of the subsoil water level on cotton.
2. Reduced watering experiments.
3. Yield tests of nine varieties of cotton.
4. Spacing tests.

"As an instance of the amount of work entailed by only one of these experiments, the proposed variety tests may be taken. Nine varieties of cotton will be grown on the chess-board system at five stations. When the necessary sub-divisions are made there will be 270 plots. If the number of plants under observation in each plot be placed at a minimum figure of 100 plants, the work involved for the Botanical Section alone amounts to regular counts of flowers and bolls of 27,000 plants during several months of the year.

Similarly with regard to the Entomological Section. Thus to test the incidence of loss due to the pink boll worm, the entire yield of at least 300 plants per plot is required. The collection of this amount of material represents ten days' work for a trained man, all of which falls within a period of only a few days, and to carry out these observations at only one of the five experimental stations entails picking the bolls from 16,000 plants, which means in round figures (taking an average of 20 bolls per plant) that 320,000 bolls will have to be picked and each one separately packed in paper.

"In addition to the foregoing, the agricultural and physical aspects of these experiments will require attention.

"Apart from these experiments the following program has been laid down:

"1. *Botanical.*—The application of plant-breeding methods to the purification of existing commercial varieties, and to the production of new and improved varieties. Cotton-seed farms are being developed for the multiplication of pure seed strains. The physiological aspects of the problems connected with plant breeding will come under study as soon as the post provided on the botanical establishment for the appointment of a plant physiologist can be filled. The mycologist will make a special study of cotton wilt, but other fungoid diseases of cotton will also engage his attention.

2. *Entomological.*—The study of the life history, distribution and control of *Oxycareous hyalinipennis* (cotton seed bug) and *Agrotis ypsilon* (cut worm.) The study of the pick boll worm is being continued.

"3. *Chemical.*—Observations in connection with manures and subsoil water. A study of the bacteriology of Egyptian soil. The chemical investigations arising out of the composition of cotton seed and the changes which occur during storage.

"4. *Physical.*—The physicist will be mainly occupied with the field experiments. In addition he will do a good deal of laboratory work on the measurements of length, thickness, uniformity, etc., of cotton fiber. He will also be engaged on the statistical work resulting from the field experiments.

"The advantages of having experiments inaugurated and controlled by the Board is already evident, and, whereas in the past experiments have been carried out from the point of view of one branch of science only, such experiments will now be conducted by botanists, entomologists, physicists, chemists and agriculturists, all working in close co-operation.

"On the entomological side the very important question of the value of the campaign against the pink boll worm instituted by the Ministry of Agriculture has been referred to the Board by the Under-Secretary of State, for an expression of opinion, and a report presented by one of the entomologists attached to the Ministry has been studied and various suggestions made.

"The formation of a library having reference to cotton has been arranged for, as also the immediate publication of various preliminary reports made by members of the Ministry of Agriculture, and the results of all research work carried out by the Board will be published at the earliest possible moment."

In recent years the British Cotton Growing Association has devoted much time and money to extending cotton cultivation in the British possessions, with varying results, generally believed by many American cotton growers to be unsatisfactory. The problem is being attacked with new energy and in a new way and the result of the future should not be predicted by the accomplishment of the past.

American Cotton Needed for Poland's Textile Mills.

An immediate need in the Polish textile industry, is American raw cotton. The annual consumption of the Lodz mills alone, before the war, was nearly 300,000 bales, about 80 per cent of the total cotton consumption of the district. Today these plants are 75 per cent. efficient from a mechanical point of view and will be about 100 per cent. efficient in the replacement of all damaged or removed parts by the beginning of 1921.

The woolen mills in the districts are almost 100 per cent, pre-war efficient now, and are chiefly controlled by British capital, which supplies the mills with wool and re-exports 50 per cent of the total production to other markets, by agreement.

An agreement has been recently concluded with the United States whereby this country agrees to deliver cotton or wool to Poland in exchange for articles manufactured from those raw materials. In this way Poland will be enabled to retain 40 or 50 per cent of the imported raw materials for her own consumption.

Many small machine shops and factories for textile machinery are now at work supplying spare parts and it is hoped that the 47,000 looms and 1,900,000 spindles of the Lodz of pre-war days will be all again in operation by 1921.

Progress is being made, slowly but surely, in Poland, and the aid of outside relief organizations, the chief of which is the American Red Cross, is proving of inestimable assistance.

Notes About Men You Know.

GEORGE DOWMAN, for many years connected with the Dowman-Dozier Manufacturing Co., of Atlanta, having organized this business and supervised the construction of a great number of articles in sheet metal and rolled steel, securing their approval by the Underwriters' Laboratories, has opened an office in the National City Building, in the center of Atlanta's business district. He will now devote his entire time to the promotion and sale of fireproofing specialties and equipment for buildings. He has a complete line of such devices as should be used to reduce the rate of insurance on the buildings themselves and the contents therein. Mr. Dowman will specialize on cotton mill equipment and accessories and will be glad to give any manufacturer the benefit of his wide experience and advice.

M. F. COLE, president of the Newnan Cotton Mills and vice-president of the Cotton Manufacturers' Association of Georgia, died at his home in Newnan, Ga., on September 7 after an illness of less than 12 hours. He was one of Georgia's best known cotton manufacturers and bankers and was for many years general manager of the R. D. Cole Mfg. Co., of Newnan, a position from which he resigned several years ago to take up his cotton mill work. He was a director in the Citizens and Southern Bank of Atlanta and the First National Bank of Newnan.

GEORGE B. SCOTT, president of the Scottdale Mills and the Georgia Duck & Cordage Mills, died at his home in Decatur, Ga., on September 6 after an illness of two weeks. Mr. Scott was the only son of the late Col. George W. Scott, founder of Agnes Scott College and was born at Bucher's Mills, Pa., 65 years ago. He moved to Decatur in 1877 and was one of the pioneers in the development of that section of Georgia. He was particularly devoted to Agnes Scott College, and as a member of the board of trustees gave liberally of his time and money for the upbuilding of this institution.

JOHN B. BOYD, superintendent of the Rex Spinning Company, Gastonia, N. C., died at his home there on September 9. He was 62 years old, and had been in ill health for several months prior to his death. He was at one time superintendent at the Chadwick-Hoskins Co., Charlotte, N. C., leaving there to become superintendent and manager of the Patterson Mills, Roanoke Rapids, N. C., a position which he held until going to the Rex Mill two years ago. He was a brother of H. H. Boyd, president of the Southern Textile Association.

MILTON ENSOR, superintendent and general manager of the Roseland Cotton Mills Company, Lincolnton, N. C., who took up the work of completing and installing the machinery in this mill at the death of C. E. Stratford, has completed this work. He has been appointed to the superintendency of the Adrian Cotton Mills and the American Spinning Company's cotton mill under construction at Mount Holly, N. C.

JOHN D. STRATFORD, who has been associated with Mr. Ensor in the work of constructing the Roseland Cotton Mills, assumed the management thereof on September 1.

FRANK E. HEYMER has been appointed superintendent of the Piedmont Cotton Mills, Egan, Ga.

R. F. FERGUSON, recently resigned assistant superintendent of the Ware Shoals (S. C.) Manufacturing Co., has been appointed superintendent of the Lydia Cotton Mills, Clinton, S. C.

H. H. WILLIS has resigned as assistant professor of textile industry at Clemson College, S. C., to accept the position of assistant supervisor, trades and industries, of the State of North Carolina. His headquarters will be in West Raleigh, N. C.

J. W. THOMPSON has been appointed superintendent of the Payne plant to succeed Mr. Green.

RALPH WILSON has resigned as superintendent of the Floyd Cotton Mills, Rome, Ga., and gone with the cotton firm of Howell & Co., of the same place.

R. S. BLALOCH, from Union, S. C., has become manager of the Blue Ridge Hosiery Mill, Landrum, S. C.

G. B. MCCOMBS has resigned as superintendent of the Inverness Mills, Winston-Salem, N. C.

W. R. COGGINS, formerly spinning foreman at the Loray Mills, Gastonia, N. C., has been made superintendent of the Inverness Mills succeeding Mr. McCombs.

E. S. TENNENT, the well known purchasing agent of Spartanburg, S. C., was recently appointed purchasing agent for the mills of the Consolidated Textile Corporation. This appointment makes Mr. Tennett the largest textile purchasing agent in the world, raising the number of mills with which he is connected in that capacity to 78.

ARTHUR J. CRAMPTON, president of the Textile Mill Supply Co., Charlotte, died recently at the White Oaks sanatorium, following an illness of several months as the result of stroke of paralysis. He was 58 years old. When he moved to Charlotte about 30 years ago, Mr. Crampton was for several years connected with the Charlotte Supply Co. In 1898 he organized the Textile Mill Supply Company and was its active president until his health failed.

W. L. CHANDLER, purchasing agent for the Dodge Sales & Engineering Company, Mishawaka, Ind., has been nominated for the presidency of the National Association of Purchasing Agents. Mr. Chandler has been active in the affairs of this organization of purchasing agents since its beginning four years ago. His leadership and work as chairman of the standardization committee of the association, has in a large measure been responsible for the widespread recognition and use of the standardized catalog size. He has also been instrumental in urging the adoption of a standard invoice form and in the standardization of other business forms, methods and procedure. Mr. Chandler also served as chairman of the committee of the National Safety Council that developed the present universal danger emblem of the council. The council later placed him on its executive committee and elected him to a vice-presidency. Another one of his accomplishments was a complete research of employees benefit associations, covering an investigation of some 600 associations and resulting in the compilation of 28 charts showing various combinations of dues, benefits, and waiting time. As chairman of the drive in his county, he put the county "over the top" in the Victory Loan campaign.

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How Other Men Manage

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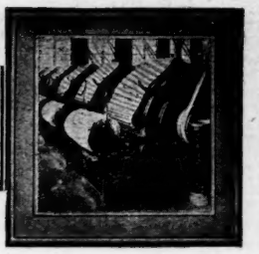

Cotton Weaving Problems.

EDITOR COTTON:

It is not the intention of the writer to deal with the 1001 problems and difficulties which arise in weaving, but rather to point out some ways in which the loom fixer may be assisted, the weaver encouraged and satisfied, and the quality and quantity of the work improved.

At the outset it is assumed that the work in the slashing room has been efficiently performed. All beam heads absolutely true and properly tightened, yarn properly separated with no broken ends or flats and a suitable amount of two-ply yarns of the correct lea in the selvages, according to the particular class of work. The warp sized, taking into consideration the humidity of the particular weave room for which the work is intended, and the length of time that may elapse before the warp reaches the loom. Before passing from the subject of slashing at least one more point is deserving of note. It is the custom in some mills for the slasher to turn off steam altogether at the doffing of beams. Thus the cylinders are filled with air as the steam dies out. As soon as the slasher has got a new set working the full pressure of steam (10 lbs.) is turned on. Though the indicator may register the pressure, there is not sufficient steam for drying purposes, until the air has escaped the best way it can, by the buckets and steam trap. But as the taps are all closed against its escape, the air which has neither heating nor condensing influence, is churned about inside the cylinders, and it is not an uncommon thing to find at the bottom of the loom beam, a few hundred yards as hard as a board, because the water in the size has not been dried out.

In the drawing-in room, reeds and healds should be kept in first-class order. New healds should be absolutely free from lumps or roughness of any kind that would have a tendency to soften the warp yarn. Great care should be taken to see that the reeds are perfectly free from rust, especially between the dents. And, in order to insure a perfectly level shed each leaf of healds should be exactly the same depth.

In the weave room the weaver and fixer are up against the carelessness and inefficiency of every preceding department, often a serious matter. Here is required the best technical, practical, and scientific training it is possible to obtain. By scientific training I mean accurate knowledge. It has been said that "The biggest problem of the weave room to-day is the fixers." More often than not the weaver receives but a poor training, and the fixer is looked to, to keep her right as well as attend to his ordinary duties. If there are learners or backward weavers in a weave room, it will certainly pay to have a highly trained person to assist them in their difficulties. All that should be necessary for the fixer to do would be to call attention to the worker that is in a difficulty. If weavers were passed (1) Through the slashing room and shown the importance of keeping the warp straight and well separated, and had the object of slashing explained to them; (2) Through the drawing-in room to see how the healds and reeds are put on, the measures adopted to keep the warp straight, and taught the respective drafts—better results would ensue than after any attempt to teach them in the noise of the weave room.

In the weave room let her understand something of the particular finish certain classes of goods are to receive, pointing out the importance of good cloth and emphasizing the necessary points. The speed of the looms could be pointed out and explained, with the percentages allowed for stoppages and breakages, and what result was expected. Give her to understand she is expected to work with, not for the management, for the good of the firm, and that only by increased production can articles, or the rate of living be lowered and the manufacturers enabled to pay increased wages. It is much better that workers be taught such things correctly, rather than allow them to be instructed by those who either don't understand, or wish to teach them in a perverted way.

As the human factor in any industry is more than three-fourths of the whole, so no general scheme for the advancement of the cotton trade will bring complete success unless the interests and the welfare of the workers are included.

Every fixer should be a good weaver, have had a technical training; a good general education particularly in physics, textile mechanics, and mathematics and know something of economics. To some this may appear a high standard, yet it is but an asset with which he may start, and to which he shall have to add, if the cotton industry is not to be left behind in the march of progress. The necessity cannot be disputed. Still there seems nothing insuperable in providing a way to teach men to fix, and letting every man have a proper technical training. The problem seems to be a dual one. (A) The training of the young fixer whose ideas have not become settled. (B) Assisting and improving the fixer as we find him.

(A) It seems quite possible for the manufacturer to adopt methods whereby the younger men may receive the requisite training. Too much care cannot be exercised in the selection of such men. It should not be considered sufficient if he possesses the sole qualification of being a good weaver—his education, inclinations, and disposition should receive the careful thought of those responsible. His attendance at a technical school should be made compulsory. If through circumstances he should not be in a position to pay the technical school fees, these should be paid by the manufacturer, and an opportunity be given the student for re-payment spread over a considerable period. If a good attendance is maintained at the classes and certain conditions fulfilled, then the entire cost of school fees

should be borne by the manufacturers, who should cooperate with the school, and insist on at least a monthly report of each student being sent them.

Should it so happen that the distance of the school from a particular center makes a student's attendance impossible then it is up to the mills of the district to combine and provide a suitable teacher, or teachers.

(B) As to assisting and improving the fixer as we find him—two courses might be possible here. (1) To provide a special class, confining the membership to those who had been employed as fixers for say 10 years. Here is required a highly practical teacher of mature years, with a technical training if possible. One that knows more than the men themselves, and can demand their confidence. (2) Have a weekly, bi-monthly, or monthly conference at the plant, make the men feel quite at home and encourage them to talk as they would among themselves of their difficulties and experiences. Often they will be able to help each other, even if the overseer or superintendent cannot. It may be that the opportunity was the only thing needful.

An overseer should be able to teach his help, to show the way a thing should be done and why. Get to understand the weak points in human nature as in industry and exercise tact, sympathy and judgment. It is a great matter for the overseer to enjoy the confidence of the workers. It should be possible for him to figure out what production he is getting not only comparatively, but actually, so as to be able to lay his hand upon the weak spot and apply the remedy. He should try and go one better than his competitors. Every overseer knows his loom speeds, and should also know what effective result is being obtained from every section of the weave room. For instance, if his looms are running 170 picks per minute, and an effective result of only 140 picks is obtainable, there is a loss of over 17 per cent of the total time. A matter for attention! It would be quite an easy matter to have production clocks placed in each weave room, or one for each fixer. The clock hands to be moved forward or backward each week as the production rose or fell.

To the manufacturer who expects 100 per cent result, getting 140 effective picks from a loom speed of 170 is a loss of 3½ hours per piece, which multiplied by the number of pieces per week means a serious extra bill for loom rent, or overhead charges, and one that will eat up a considerable amount of profit.

Snarled and looped weft or filling, reedy cloth, selvages, cutting and bursting weft, breaking warp, beating home the weft pick, and the running of the shuttle, are among the most difficult and frequent of the fixer's problems. Each fixer meets these difficulties in his own way, yet there must be a best way out if it can be found. Snarled weft is a fault generally found in alternate picks and may be caused by—(1) Picking too late, or too strong. First, find on which pick the snarl occurs. (2) A hard twisted weft. If the weft is damped before use, it will greatly reduce the tendency to snarl. (3) Shedding too late or too early. In plain goods this has been remedied by moving the shedding tappet half way round on the tappet shaft, thus treading from the opposite pick. (4) Neppy warp yarn. For which apply more tension to warp and weft. (5) Producing narrow cloth in wide looms. (6) Weft used direct from the frame without being stored for a day or two. (7) The shuttle not being properly checked in the box. Looping is a defect where the weft is forced through on either side of the cloth by the warp threads. It is generally due to the timing of the shedding, faulty shedding, and faulty tension on the warp. Another cause which has a tendency to this fault is a hard warp.

Reedy cloth may result from—(1) The use of shedding tappets with too short a dwell. (2) Having the sheds too large, and not bottoming properly on the race-board. (3) The lease rods being too near the healds, or being too large. (4) The heald roller not balanced properly. (5) A low back rest, front rest, or temple-rod. (6) The shedding tappet being too late. (7) The healds not being hung plumb, or bound up too tightly.

Selvages—While an early timing of the shedding is the best for driving home the weft pick, and preventing reedy cloth, a later timing will materially assist in making good selvages. In weaving narrow cloth in wide looms the weft will require to be tensioned in the shuttles. Other causes of bad selvages are—(1) A dull pick. (2) Side temples not holding out properly. (3) The selvage cotton too coarse. (4) Uneven shedding, or a loose top shed. (5) The warp having a larger circumference on the loom beam at the selvages, caused by using a narrow press-roller when slashing. (6) The selvage dents in the reed being drawn together with a snap as the weft pick is driven home. Lacing the dents with fine cord is sometimes resorted to as a remedy.

Cutting and bursting weft is a most difficult matter to remedy especially in fine work. If the weft picks are pulled out until the broken one is reached, and it is stretched out from the selvage along the shuttle race, it will help to locate the seat of the trouble. Nothing eases the driving home of the weft pick more than an early timing of the shedding. In fact anything that will ease the driving home of weft pick will lessen the possibilities of bursting weft. Among other causes of cutting weft are:

(1) Projecting shuttle pins. (2) Weft fork extending too far through the grid, and the hook or pull-off end too heavy. (3) Roughness on grid bars. (4) Shuttle rebounding in box. (5) Sharp edges in weft groove of shuttle-box, or the box and shuttle not made to same level. (6) Sharp corners, or the rivets in the picker coming in contact with the shuttle-box. (7) The selvages too much crammed in the reed, which fault is sometimes remedied by timing the shedding a little later. (8) Weft getting caught between the side-temple and loom reed. As the side-temple is only needed at the moment of beating home the weft shot, it is quite unnecessary to allow it any motion whatever.

Breaking warp.—Assumed that the warp is an ordinary one and is considered strong enough to bear the strain of the particular class of work for which it is intended. But it is found difficult to weave. The following suggestions may prove helpful: (1) Time the shedding as early as possible up to a given point viz., when the crank is at back center the sheds should commence to close. This applies to plain, dobbies, and Jacquard alike. (2) Both sheds should be exactly the same size otherwise the larger one is doing all the work. (3) If beads form on warp—weave with least possible tension, reduce friction to a minimum, use smallest possible shedding, and good side temples. (4) Discover if the shuttle is being thrown against the top

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shed. (5) Use as sharp a pick as possible. (6) Keep shuttles in good order making sure the points are round, not chisel-shaped. In beating-up, what has been said with regard to breaking warp applies equally to the driving home of the weft, with the following additions: a high back and front rest, a high temple-rod and a low sley.

Running the shuttle.—In the first place all shuttles should be weighed to insure the shuttles in the loom all being the same weight. A heavy shuttle will require less pick and run much better than a light one. Those accustomed to weaving seldom might express surprise if told a shuttle sometimes attains a speed of over 16 feet per second. Something of the difficulty of running the shuttle may be seen from the fact that it is started suddenly, attains a high speed, and is drawn to rest suddenly. The following suggestions may assist the fixer in the running of his shuttles. (1) To commence with, have the shuttles the same weight, size and bevel. (2) The angle or bevel of the shuttle-boxes back and front should be exactly the same as the shuttle. (3) Adjust the picker spindle so that it will give the back end of the shuttle an upward and outward movement. (4) The plate forming the bottom of the shuttle-box should be slightly raised at the back end. (5) A loom giving trouble in this respect, should, when empty, be overhauled and the seat of the trouble located. It will help to do so if the loom is turned slowly round to a picking point and the flight of shuttle carefully noted. (6) The shedding should just touch the race-board on each side. A shed not touching the race-board has a tendency not only to throw, but to turn the shuttle. (7) Never allow the shuttle to become curved either on the side or bottom. (8) A heavy pick, or a late timed pick has a tendency to throw the shuttle. (9) Avoid a small shed with loose hanging ends. (10) Every attention should be given to the reed, that it is free from lumps and is not warped in any way. (11) The backs of the shuttle boxes should be slightly fuller than the reed. This can easily be seen by stretching a line along the reed front from the box ends. Under no circumstances should a fixer work with a short straight edge.

In conclusion, while it is given to our "Old men to dreom dreams" and to the "Young men to see visions," part of the vision of the future may be to have expert inspectors of looms, men who are specialists assisting the superintendents and overseers in our cotton mills. Such would undoubtedly assist in overcoming many existing difficulties and succeed-in making our looms do more. James Ward (R. I.)

"Railroads and Shippers—And Their Common Problem" is the title of an interesting booklet just issued by the Irving National Bank, Woolworth Building, New York. This is a thorough discussion of one of today's vital problems. It comprises an address on the same subject delivered by George C. Devol, of the Irving National Bank, before the Michigan State Millers Association. It may be had upon request.

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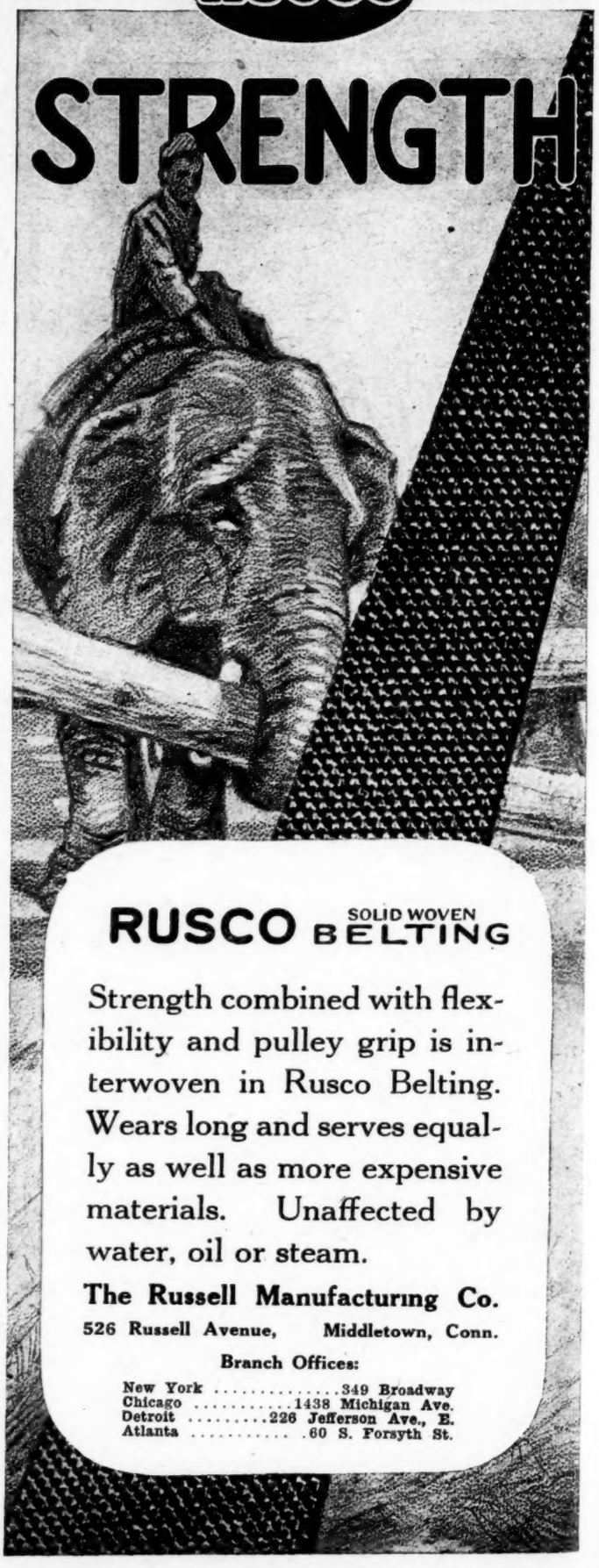

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Pasting the Lining to the Fabric and 8-folding for the Cutter.

EDITOR COTTON:

We desire to prepare some goods for the hunting coat trade will have an outside fabric of dyed duck and a lining of cotton flannel napped on one side only. The lining is to be pasted to the duck while the materials are in the rolls and after drying is to be eight folded so that sections of the coat may be stamped out or otherwise cut by the cutting trade and be ready for seaming.

Kindly describe the machines necessary for doing this work quickly, satisfactorily and economically, explaining how to avoid wrinkles after going over the pasting machine and onto the cans and also giving some recipes showing the best materials to use for securing an adequate adhesive that shall be flexible and still make the two fabrics adhere firmly together.

We shall also appreciate it if you will describe in detail the best method of construction for an eight fold table. Also any other suggestions you may think pertinent to the finishing of goods of this character. D. B. (N. Y)

EDITOR COTTON:

In answer to "D. B." I would say that it has been found that for all ordinary purposes where it was only necessary to paste the goods together temporarily while

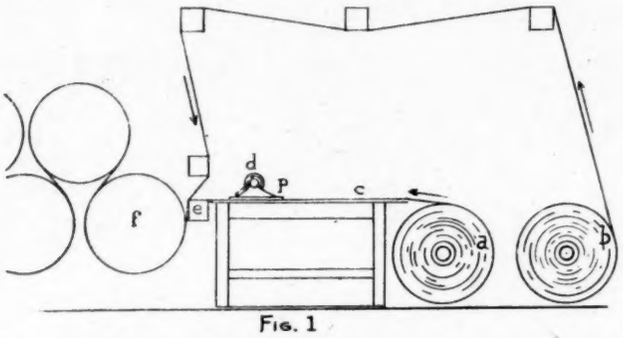


FIG. 1

they were being cut and sewed, a simple flour paste applied on a machine as shown in Fig. 1 would answer all requirements. The paste should be made from well sifted flour standing at about 10 degrees Tw. before boiling, and well boiled, free from lumps, and should contain some antiseptic, preferably mercury bichloride.

Referring to Fig. 1: The roll of duck to be lined, shown at (a), is drawn across the table (c) by the steam heated drying cylinder (f), over the lower tension rail (e). At the point (p) on the table the paste is thrown onto the slowly traveling goods and is distributed evenly and the surplus scraped off by the doctor blade (d). The lining (b) passes over and under the various tension rails as indicated by the arrows and comes into close contact with the goods as they pass and are pressed firmly together, and their immediate passage, in intimate contact with each other, over the drying cylinder (f) completes the operation and sticks them together.

I would say here that a roller in the place of the lower rail (e), as is customary in most outfits, would not answer so well because it would not smooth out the wrinkles nor bring the goods into such intimate contact as this rail will, and I would add further that any pressure, beyond that already shown, which may be used to press the two fabrics together while the paste is wet will work a positive injury to their adhesiveness to each other. It would be well to remember that they will not stick together unless there is some goodly unbroken layer of free paste between them, and that any pressure that will tend to force the paste into the interstices of the goods and away from the surface will lessen their ability to stick together.

The doctor (d) must exert nothing but its own weight on the goods, no weights or set screws being necessary.

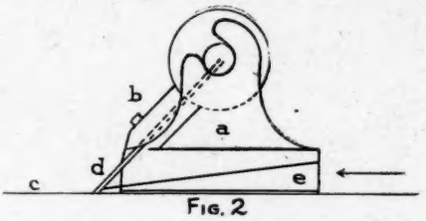


FIG. 2

The blade should be of brass or composition, set into a heavy pair of doctor shears, as shown in Fig. 2, where (a) is the standards, (b) the doctor shears, (d) the doctor, and (e) the table across which the goods are passing in the direction of the arrow. The thickness of the film of paste spread upon the goods is controlled by the two inclined planes (e), one-half of one inch wide and inserted under the blade of the doctor on the table at each side of the traveling goods. It is obvious that by advancing or retreating these inclined planes and by thus raising or lowering the edge of the doctor blade the thickness of the film to be applied can easily be controlled. All flour pastes should be used hot.

If it should be necessary to make a paste that is more adhesive than the flour paste just mentioned and one that will stick the goods together permanently, it may be made as follows:

26 ounces powdered sal ammoniac
26 ounces powdered borax
24 ounces powdered sal soda
13 pounds granulated sugar
26 pounds flour.

Put all these constituents into 17 gallons of water and dissolve thoroughly and mix. Then add 33 gallons of water making 50 gallons of water altogether and boil with steam for 10 minutes. This makes a very adhesive, smooth working paste, requiring considerable force to pull it apart even when wet.

I might say that grape sugar or glucose can be used,

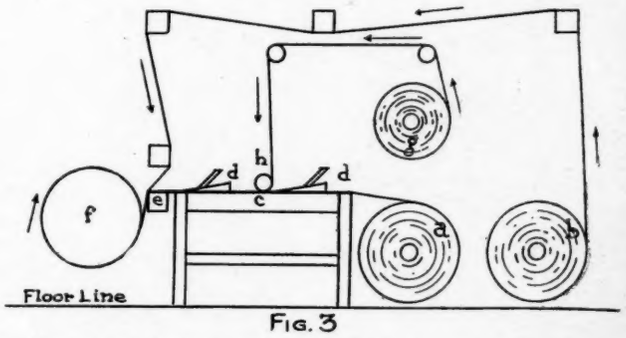
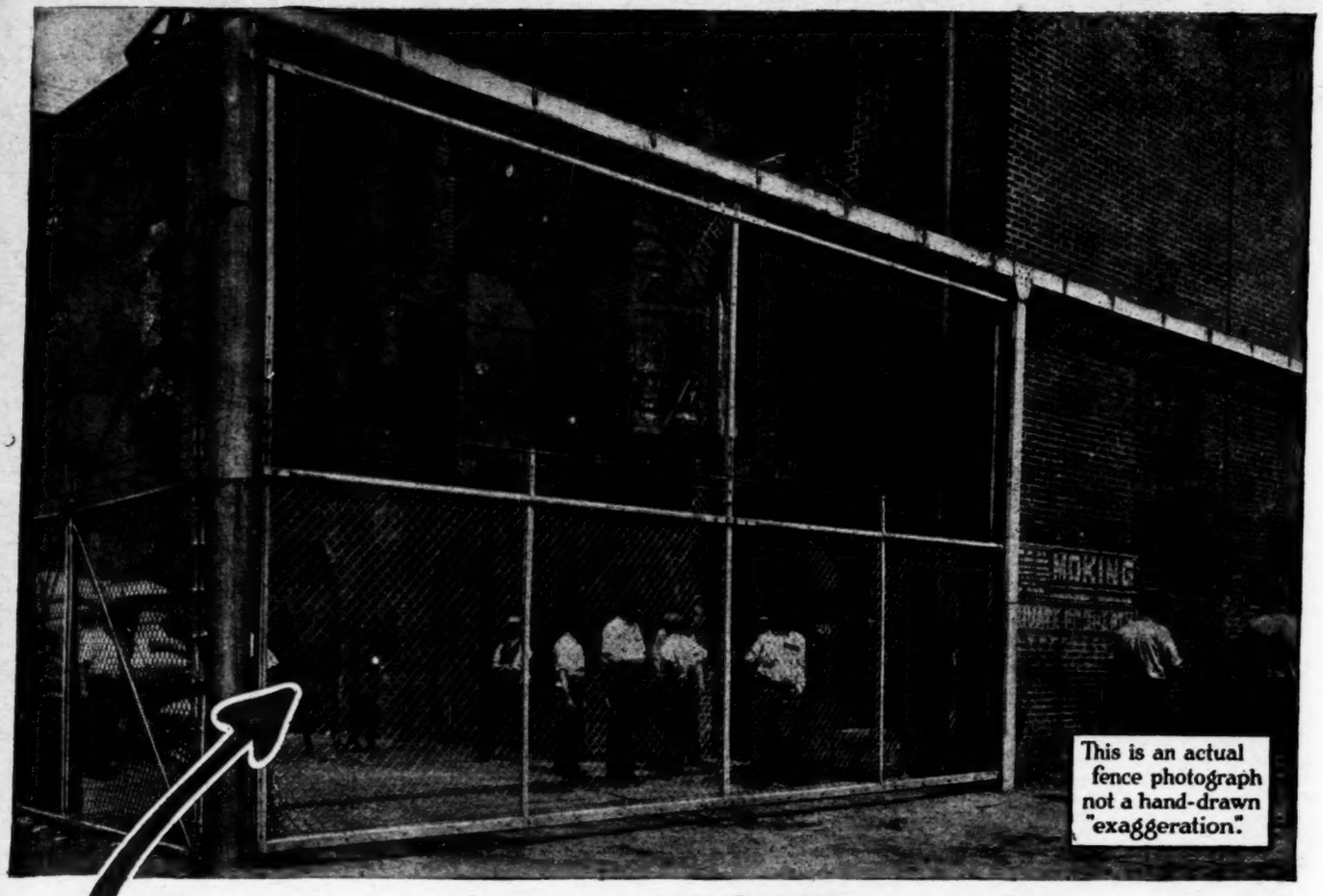


FIG. 3

in these times, instead of the granulated sugar; this only to reduce the H. C. L.

It is possible to paste the lining and the goods together for automobile coats, etc., so that they will be both water proof and wind proof and without impairing their permeability to air. This is done by inserting a layer of thin paper between the goods and their lining in such a man-



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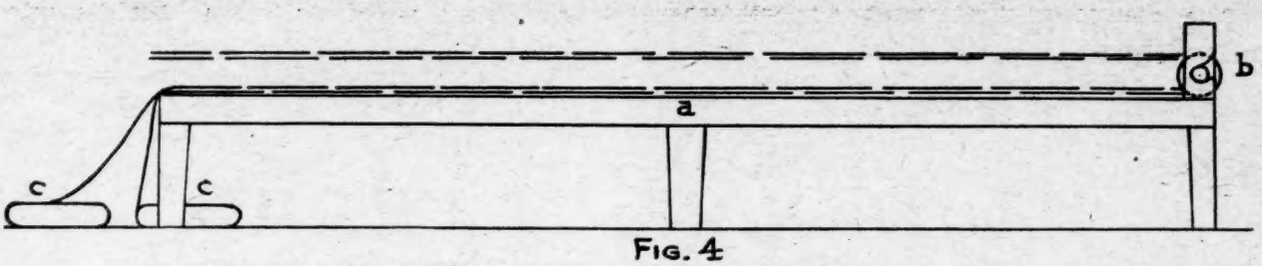

FIG. 4

ner that all are bound together by a water proof paste. This may be accomplished by using two doctors and inserting the paper from a roll, as shown in Fig. 3, where (a) is the fabric, (b) is the lining, (g) is the paper to be inserted, (d) and (d) are the two doctors, (e) the tension rail, (c) the pasting table and (f) the first cylinder of the drying machine.

The mode of operation is as follows: The fabric (a), being drawn over the pasting table (c) by the drying cylinder (f), is pasted and scraped by the first doctor (d) and passes under the roller (h) where it is met and covered by the sheet of paper run off the roll (g); this, being drawn forward by the fabric to the second doctor (d), is there pasted again on the upper side and joined to the lining (b) at the tension rail (e), from thence the whole combination is dried and stuck permanently together by the drying cylinders shown at (f).

Referring to the inquiry regarding an eight fold table, these tables are usually made something like the one shown in Fig. 4. Assuming the goods to be 60 yards to the piece, the table should be about 45 or 50 feet in length. The piece of goods (c-c) is laid on the floor and opened into two halves, the top and bottom ends are then put together so that the two backs of the goods come together inside with the faces out. Take the two ends and pass around the roller (b), double back until the four ends meet, take out the roller and replace it, draw the goods around as before, and the eight fold is complete. W. B. (Maine).

White Waste.

EDITOR COTTON:

In writing on the subject of white waste there are several things to take into consideration. There is a cause for every lock of white waste that is made. We find our first white waste made in the picker room, and I want to say right here that every time waste is made on one machine it gives more or less trouble in the subsequent processes.

The greatest cause for white waste in the picker room is the failure to start the lap or cotton on the calendar roll straight. If it is put on wadded up it will run out ahead of the other laps which will result in a lap either too thin or too thick for several inches and perhaps a yard; and the evener will not take care of this.

Then, of course, when this lap is put on the card it will naturally produce a light or heavy lumpy sliver, which on account of being too light or too knotty, will break down a great many times and will not go through the card head.

This stock can be followed all the way to the spinning room and it will be found to run badly in every process. An operative will often throw a handful of cotton on the apron behind the finisher, with an idea that the evener will correct it, but not so. It will cause knots of cotton which will result in break downs when the cotton reaches the intermediate speeders and spinning frames, thereby causing white waste.

Card hands who do not look after their machines and who do not keep the humidity right will cause ends to come down, thereby making a lot of white waste if these broken ends are not put up immediately. Drawing hands can make a lot of white waste by leaving a handful of drawing in the bottom of a can instead of piecing it to the full can and by laying it on top of the full can instead of throwing it in the waste can. There can also be an unnecessary amount of white waste made on the slubbers by not piecing onto the full can of drawing. Slubbers not kept in the proper condition will make tangled roving causing it to tangle off making white waste. Intermediates and speeders can make too much white waste by creeling before the roving runs low enough on the bobbin.

Singlings and doublings will, in my opinion, make more white waste in the spinning room than anything else provided everything is in good running order. If the spinning room gets good roving, then the spinner has no excuse for making white waste. Four of five spindles out of fix on a spinner's sides will keep the spinner torn up all the time.

Bad leather rollers will make enough white waste in a day to pay for a set of covers. Spindles out of plumb will make more than enough white waste in a few months to pay the cost of plumbing them. A section man failing to keep the spinners' ends running and in good shape will run off many good spinners and make a great deal of white waste. Bad doffing is another thing that makes a lot of white waste, and spinners taking out roving with too much roving on the bobbin also increases this waste. Spinners going away from their work and staying too long, letting the ends run down from from 15 to 30 minutes, cause unnecessary waste.

If the carder will furnish the spinner with good, even roving weighing up to standard, with the correct twist and as few singlings and doublings as possible; if the spinner will see that his spindles are plumbed and in perfect running order, his leather rollers with good cots, his steel runners in good shape, his rings smooth and not worn out, have the right weight traveler and the correct speed, keep his frame properly oiled, especially the rolls and spindles, have the doffers doff without tearing down so many ends; and if the superintendent of spinning and his foremen will see that the help do not play away from their work too long at a time, then practically all white waste will be eliminated. This may seem hard, but it can be done, and when it is done all hands are happier, the work runs better, the mill makes more money, and the help get more money. D. S. G. (Ga.)

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An Old Foreman Talks.

Editor Cotton:

I noticed in the August number an address made by W. C. McMann. I enjoyed reading this and it was good for me, as a man in my place has to be continually studying to keep up on his job. I am foreman of spinning and twisting at this time. I have been at this mill for about four years. We have a fine little mill and a good set of help. As my friend W. C. says, it is up to us foremen to keep good help, but I have strict rules and I see that they are put through. When I make a new rule I count the cost on both sides before I take it from my office; then I see that it is enforced.

I would like to say a few words about the young man who wants to make good in this life, for if any one ever had the young man at heart I have. I remember how I was once a plow boy, but when I was sixteen my father sold out and came to the mill, and we boys (there were five of us) had it rather hard. That was 22 years ago. However, I had not been in the mill long before I made up my mind to go up, so I started in to studying, but you know a young man in those days found it very difficult to learn as the "boss" was always afraid someone would get his job, and did not want to teach the help anything; I would ask for information, it is true, but I would not always get what I wanted. But I was learning something all the time, and I would go home at night and study.

About this time I lost two of the best friends I had—my mother and father—and it often seemed best for me to go back to the farm, for I did know how to plow without asking anyone to tell me how to do it. But I made up my mind that I would not plow any more, but that I would be a foreman some day. So I would go home at night and go to my room and get down to studying. Oh, if I could only have gotten some one to show me how this was done, and the reason for doing that.

This is the reason I have so much interest in young men who are striving to get ahead. I have four young men working for me now, and when their jobs are all on the go and look dark to them, I take them into the office and show them how to figure every change I know and say, "Boys, if any of you want to know anything at any time, if I can tell you or show you I'll be glad to do so as when I leave here I hope to see one of you take my place."

I say to them, "Here are some things to keep in mind when you are put on a job: Don't fail to run your job to the best of your ability. If you have to work an hour over time, don't ask if you are going to get paid for it. I have my first time to ask for a raise in wages, I always got mine by running my job right. If a man won't run his job right for $3.00 a day he wouldn't run it right if the mill were to pay him $4.00 a day. And don't think that the foreman doesn't know how you run your job, for he does. So be on the go at all times."

When I was running a second hand's job in a South Carolina mill, a good many years ago, there came to the mill a young man from college. He went to work sweeping; he stayed on this job four weeks and then took the finishing room. In six weeks he took charge of the weaving and after running this for four months he was made superintendent of the mill. I said he was going some, he had been a plow boy three years before. However, he was clever enough to get and keep men with experience to run his rooms. I think that there is where a man stoops. If I could have had the chance he got, I felt I would have been all right. My advice is, "Don't give up, you will come out all right some day.'

I once worked for a man for five years as second-hand in spinning. He was a good man, but he was afraid some one would get his job, and when I would ask him to show me how to figure a change on spinning, he would say, "I'll show you that some time, I haven't time just now." I guess he never has gotten the time for he hasn't shown me yet. However, four years later he came to me for a job. What did I do? I gave him a job and saw that he ran it. One day he came into my office and said he was down and out and told me all about it. I was sorry for him and asked him if I would get him a job, would he run it. He said, "I'll do my best." I had a friend in another mill who wanted a man to take charge of his spinning, so I wrote him about this man. My former "boss" got the job and the last time I heard from him he was running it all right.

So don't be afraid of the other fellow. If you get down, do not stoop. If you get a chance to make good, take it and if you fail, try again until you can stick. It may look hard but it could be worse. And never get it into your head that no one can teach you anything. All of us older ones will lie down and die some of these days and it is the young men who must fill our places. So I ask my young men, "how about you? Will you be ready or not? Take my advice and so train yourself that when you get the opportunity, you will be fit and can say, 'Here am I, take me.'"

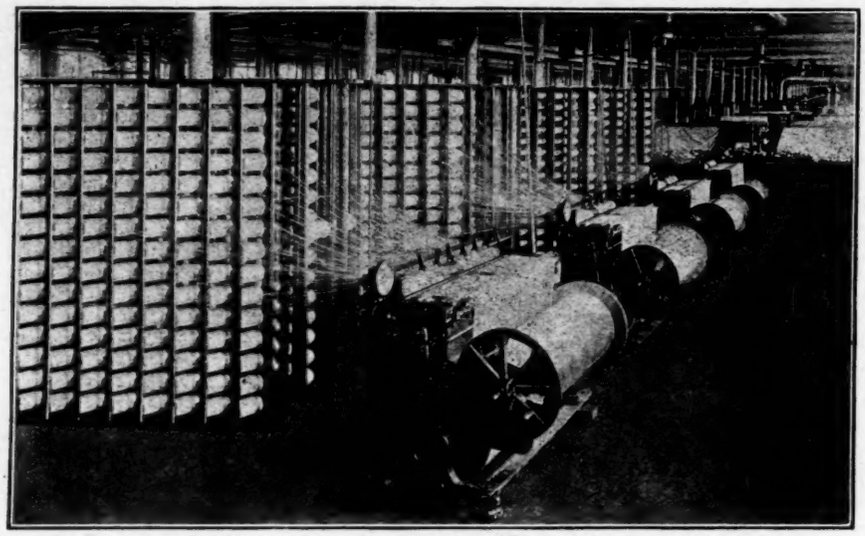
You know, it seems to me that some of the young men now-a-days are slower about going up than in the old days. I often meet a man with whom I worked 23 years ago and ask him, "John, what are you doing now?" and he replies, "Same old thing, running frames." "What, all these years and you haven't gotten anywhere yet?" And he says, "Well, you know I went back to the country and stayed five years but didn't do well out there." If I couldn't make a plow boy, I would hang up and say, "It's me, I am no good" and I wouldn't blame anyone for it.

I hope these lines will be of help to some young man.

L. W. B. (N. C.)

The National Aniline & Chemical Company, Inc., announces that it has resumed the manufacture of Niagara Black Blue R, a pre-war type, but which will be offered under the designation National Niagara Blue NR. This is a direct cotton color. It is especially useful for the production of heavy blues on cotton and allied fibers. Dyeings produced with this new type possess very good all-round fastness, and particularly to washing. When dyed in a neutral bath upon mixtures of cotton, wool, and silk, the cotton takes a slightly heavier shade, which is of decided advantage. When the same fibers are dyed in a slightly acidulated bath the three fibers are dyed practically uniform. Increased fastness to washing is obtained by after-treating with formaldehyde, which has but slight action on the shade. Dyeings subjected to diazotising and developing with National Developer B are somewhat bluer and darker.

Scientific Lubrication Series—No. 6



SLO-FLO

The Scientific Lubricant for Textile Machinery

Increases Lubricating Efficiency Eight Times in the Warp Room

NOBODY knows better than the man who has charge of the warp room that the spooler reservoirs have to be cleaned out every thirty days or so. A mean job. And every time you clean the reservoirs and fill them again you run another chance of getting oil on the running parts. When this happens it means oil-soaked yarn, and plenty of it!

In mills that use Slo-Flo, a single lubrication often lasts six months or longer. On the average Slo-Flo has eight times the lubricating efficiency of ordinary lubricants. A big saving in lubricant cost alone, not to mention that greatest of all savings—*No more stained yarn!*

The cohesive qualities of this semi-liquid lubricant absolutely prevent it from crawling, throwing or dripping.

For Spoolers, Cylinder Bearings and Cams we recommend Slo-Flo No. 24
For Spindles on Spoolers, Slo-Flo No. 20

Write us for a demonstration

SWAN AND FINCH COMPANY
NEW YORK

Quality Lubricants Since 1853

Chicago Philadelphia Boston San Francisco
Buffalo Detroit Atlanta Charlotte New Orleans

CATARACT REFINING COMPANY, Limited
Toronto, Canada London, England

SCIENTIFIC LUBRICANTS *for* SCIENTIFIC LUBRICATION

A Question on Weaving and Its Answer.

Editor Cotton:

I am making goods 28 inches wide, with 10s warp, 11.65s filling, and 21 dent reed, 3 threads to the dent. I desire to make goods 28 inches wide, with 30 warp and 40 filling and I shall appreciate it very much if you will advise me what reed will be necessary and how many picks per inch must be made to make this goods weigh 7.50 yards to the pound. D. E. T. (N. C.)

Editor Cotton:

Replying to "D. E. T.," he does not state the number of ends he wishes to put per dent in his new construction, therefore my calculations are based on three ends per dent. I have figured 66 ends per inch in the warp. 66 × 28 = 1848, 32 ends added for selvage making a total of 1880 ends in the warp, or 540 grains per yard. Figuring 64 picks per inch in the filling, 64 × 36 = 2304, divided by 28 equals 1792 yards of 393 grains of No. 40 yarn.

540 Gr. No. 30 warp yarn × 7½ yds. per lb....4050 Gr.
393 Gr. No. 40 filling yarn × 7½ yds. per lb...2947 Gr.

Total .....6997 Gr.

I have made allowance of 5.3 per cent contraction in the filling and 3.5 per cent contraction in the warp.

Now we have 66 warp ends per inch and 64 picks per inch, 3 ends to the dent, 22 dent reed. As you will see from my figures, this figures 6997 grains for 7½ yards, or less than one-half grain per yard light.

While I have never made goods as light as 7½ lbs. to the yard, still I believe these calculations are correct. However, should any error be found in my figuring, I would appreciate having it called to my attention in these columns. Superintendent (Ga.)

What Books Do You Suggest?

Editor Cotton:

Can you advise me where I can get a book along textile lines that will enable me to become better acquainted with cotton and woolen material and that will give me the necessary tests to find the grade, etc.? I should also like to have information regarding the manufacture of khaki goods from the beginning to end. Inquirer (N. J.)

Some Comments.

Editor Cotton:

I wish to call the attention of Contributor No. 14 to one or two statements which he made in his article on "Making 12s to 20s Yarns" which was published in the "How Other Men Manage" department of the September number of Cotton.

The first of these appears on page 850 where he says that a porcupine beater is sometimes called a carding beater. This is entirely erroneous as the porcupine beater has no relation whatever to the carding beater. Its construction is entirely different and its action on the cotton is of an entirely different character. The porcupine beater also known as the porcupine cylinder "Buckley Type" is mostly used in openers or in the first section of a two beater "breaker lapper" and it provides a very thorough opening which makes it very valuable in handling low grade dirty cotton as it pulls apart the stock thoroughly and puts it in excellent condition for the following blade beater. In direct contrast to this comes the "Kirschner Patent" carding beater also known as the pin beater and its action on the stock may be described as follows: The object of this beater is to produce a combing action which will straighten the fibers and put them in the best possible condition for the card. It also tends to produce a lap of more even consistency and it is used extensively on the finisher picker.

Again, on page 855, "No. 14" says that the third and fourth steel rolls on the drawing frames are *sometimes* set wider than the first and second. I venture to say that the contributor himself would never want to use any sliver where they were set the same. Again, on the same page, he says that the draft on the slubber should be from 4 to 4.65 whereas I should prefer a range of from 3 to 5 with 4 as the best possible draft. Just below this on the same page, this contributor speaks about 1 turn per inch as the best possible twist for this weight of roving but he omits the fact that the length of the staple being used will very largely govern the turns per inch to be inserted as the twist multiplier will be increased with short staple stock and decreased with long staple stock.

In pointing out these statements made in the article submitted by "Contributor No. 14," I wish to say that I offer these remarks in the spirit of constructive criticism and not as a cynical critic in the matter.

Benjamin (Conn.)

Belts.

When a girl wears a belt longer than 24 inches or a man girds himself with one stretching more than 40 inches, they immediately become worried and begin to diet.

But The Goodyear Tire & Rubber Company is manufacturing two belts 12,000 inches in length.

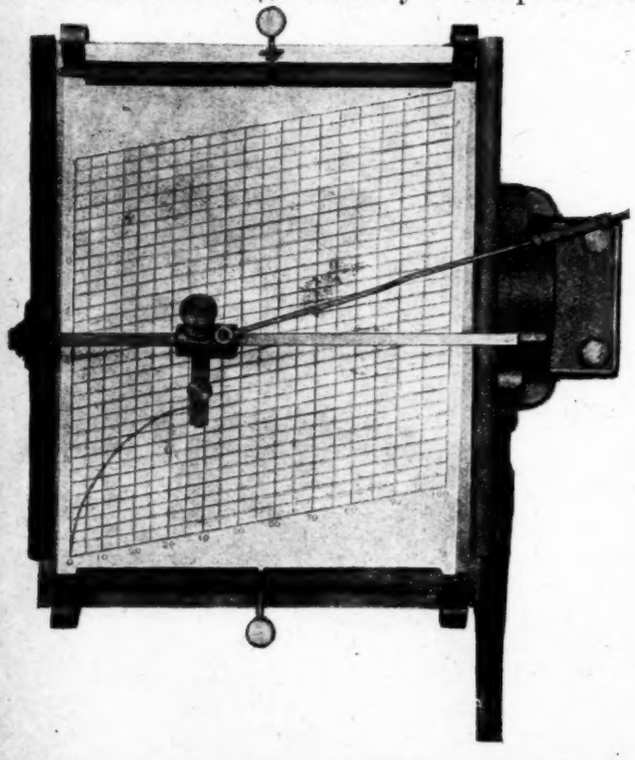
No, Genevieve, they are not for human support—but are conveyor belts for the purpose of carrying materials for long distances in commercial use.

Each belt will weigh seven tons when completed. They will be 48 inches wide and each will consist of seven plies. If spliced, they would stretch more than 2,000 feet, or nearly half a mile. The fabric used in making these two belts, if laid in a straight line, of single ply 48 inches wide, would reach for 14,700 feet, or more than two and three quarter miles. If used as a floor covering, the fabric used in manufacturing these two giants would spread over 58,800 square feet of space or approximately cover five times the floor space in the largest gymnasium in the country. If the fabric necessary to make the belts were used as a tent covering, it would house 14,600 people standing side by side. The weight of cover stock used in the two big conveyor belts weighs about five and a half tons.

The National Shawmut Bank of Boston is sending out a comprehensive booklet of 18 pages on "Foreign Exchange." It deals with its subject in a brief, though clear, manner, discussing the importance of foreign exchange as a factor in foreign and domestic commerce. Copies will doubtless be forwarded to those requesting them.

SCOTT TESTERS

Charts simplify detail and place the results before you in comprehensive form. In testing materials the mass of detail collected often tends to befog the real value of the work. An autographic chart of your test not only gives you a perfect understanding of the results instantly, but assures you a correct record. Both Scott Testers and Recorders are entirely automatic, and neither the test nor the chart are subject to human influence. Such records are practical for mill work as well as laboratory, are indisputable, and may be preserved indefinitely. The cut shows the Combination Tester equipped with Autographic Recorder. The stress strain curve is generated by the movement of the pen horizontally across the chart which moves downward in direct relation to the stretching screw of the machine. These two movements produce a curve which accurately indicates the strength and elasticity, and also shows direct relation of one to the other at all points of the test. It further indicates crimp and residual stretch showing instantly a complete comparison of various materials when recorded on the same chart.



This device is extremely simple in design, very strongly constructed and has no delicate parts or cords to require adjustment. No especial skill is required to operate it, and weather or atmospheric conditions will not affect its accuracy. The Autographic Recorder can be applied to any of our iron framed vertical machines, or Horizontal Testers.

Write for new catalog "D," describing this and many other attachments.

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Designs for Fancy Cotton Fabrics

BY T. WOODHOUSE AND J. IRELAND.

PART FIFTY.

An effective cloth, of simple structural form, is shown in Fig. 235; its attractiveness is due perhaps more to the color effect than to the weave. Four units of the design

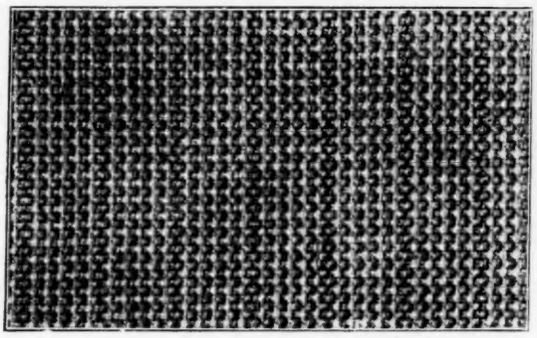

FIG. 235.

appear at G, Fig. 236, the unit being in solid marks, and the remaining three units in crosses. The draft on 6 harnesses appears at H, while the weaving plan is at J in the same figure.

A great variety of effects could be obtained by using the same weave structure and changing the colored warp threads.

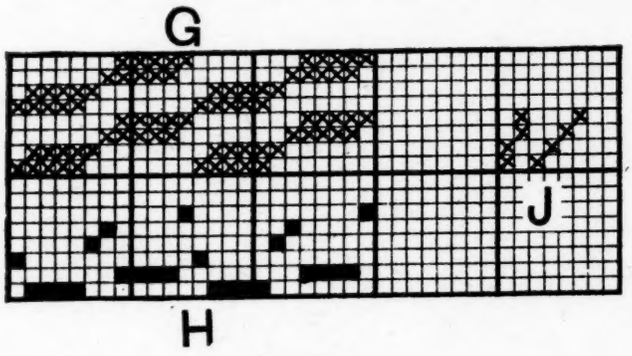

FIG. 236.

In the cloth from which Fig. 235 was prepared, the colored threads are all of a delicate hue and are arranged with the white threads in the following order:—

Warp: 174 threads per inch.

Pale Heliotrope	4						4	=	8
White	1	8	8	8	8	8	1	=	42
Pale Olive Green		4	4		4	4		=	16
									66 per repeat

The filling is all white, and there are 48 picks per inch. The large number of warp threads per inch as compared with the comparatively small number of picks per inch enables the warp threads to predominate on the surface of the cloth, but at the same time the arrangement is responsible for the rich effect, and, moreover, it offers a means of a large production from the loom.

The structure of the design is quite simple, and it will be observed that the weaving plan at J is a combination of the 2 up 2 down warp rib and the 3 up 1 down twill.

An excellent spot effect is that which is photographically reproduced in Fig. 237. It represents a cloth of a firm character and on which is developed a spot pattern by extra warp threads. There are three different warps in this cloth, two for the ground part and one for the spots which are arranged on the drop pattern or plain weave base.

One of the ordinary warps is employed in double threads, and gives the ground weave of the fabric; the other ordinary warp is used singly as a binder, and is of a higher count. The binder warp helps considerably to produce the above-mentioned firmness in the cloth. The warping particulars are as under:—

Light Serge	2	2	2		2		2	2	2	2	= 16
White		1	1	1	1	1		1	1	1	= 8
Black				2		2					= 4
											28 threads

There are two repeats of the above threads in one repeat of the design, hence there are actually 56 threads in a repeat.

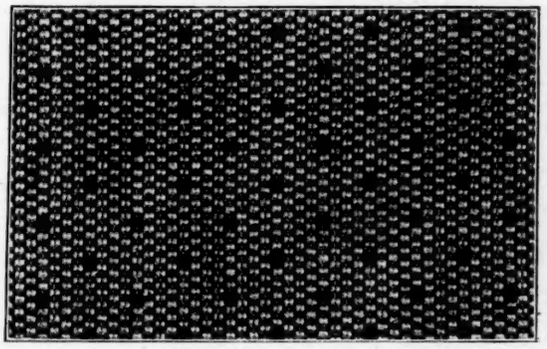

FIG. 237.

The filling is self-colored and of an olive-green shade, and there are 65 picks per inch in the present state of the fabric. Neglecting the four extra spotting threads, there are 120 threads per inch.

One complete repeat of the design is shown at K, Fig. 238, the unit comprising 56 threads and 24 picks. The crosses indicate where the double threads and the single binder threads are lifted, and the solid marks indicate where the

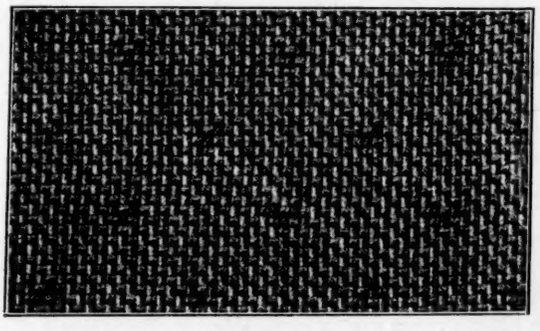

FIG. 239.

extra spotting threads come to the surface to form the figure. No stitching points appear on the spotting threads. The draft at L shows that 7 harnesses only are necessary, and the weaving plan on 7 harnesses and 24 picks is given at M.

It will be observed that the single warp threads, those we have termed the binders, all weave in the same 1 up 1 down

ANNOUNCING—G. G. SLAUGHTER MACHINERY CO.

GREENVILLE, S. C.

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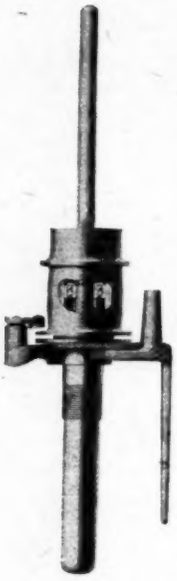

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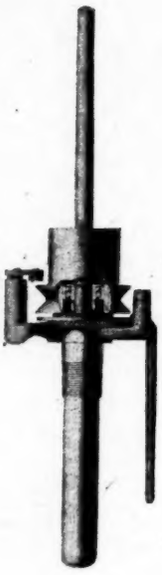
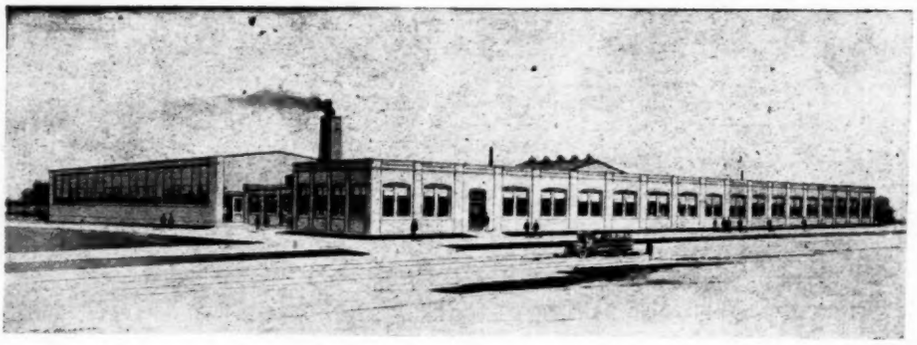


A Spindle Plant for Eight Years.



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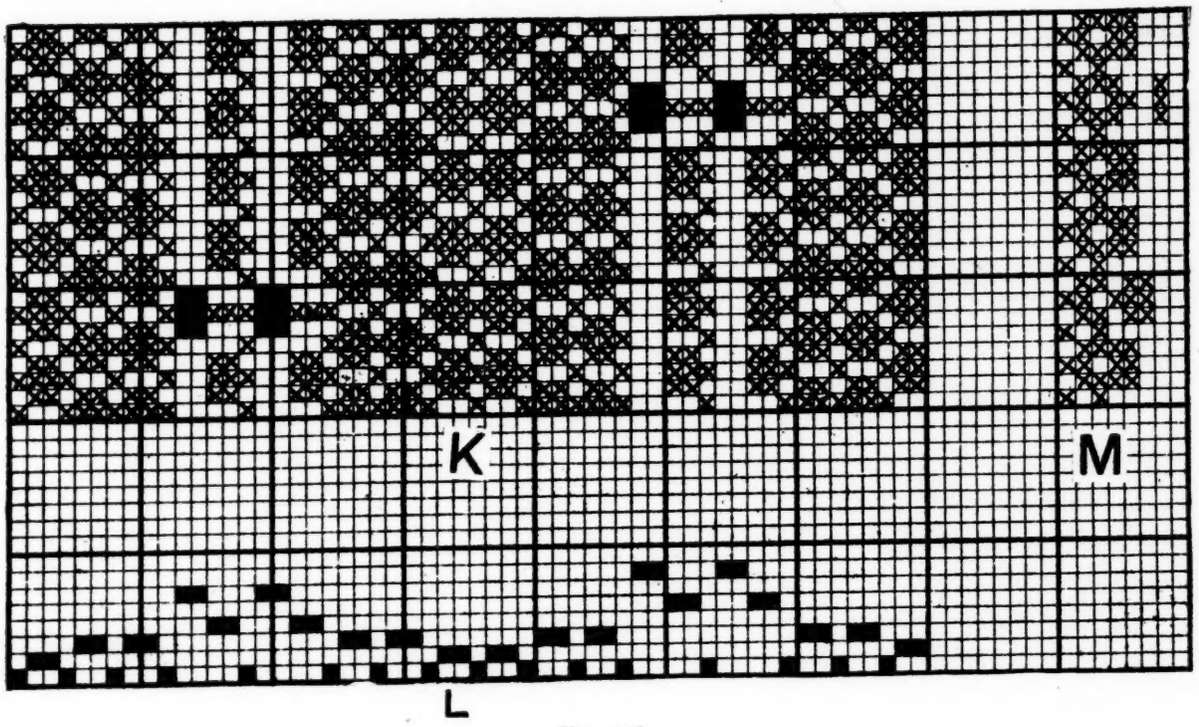

Fig. 238.

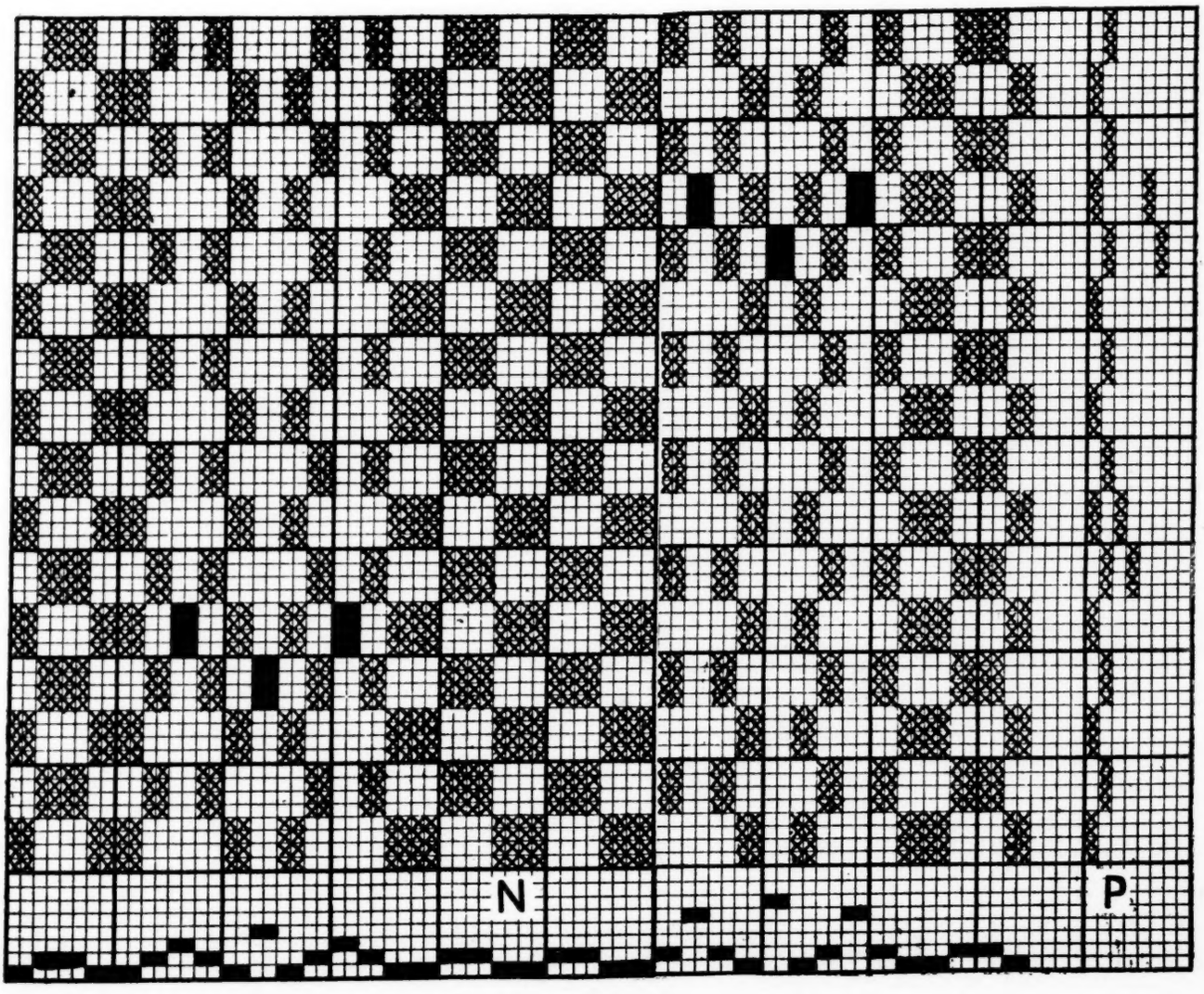

Fig. 240.

Gen'l. Manager--"so isn't there something we can do to cut out some of this roll covering expense?"

Superintendent:—"Well, it has often occurred to me that we re-cover a good percentage of rolls that ought in some way to be re-polished and used again, but I don't know how it can be done."

Gen'l Manager:—"I understand there is a recently patented machine, using electric or steam heat, and built like the usual evener rolls to save expert labor, and the manufacturers claim this machine will do this re-polishing and much more to improve drawing surfaces. When I visit the FOURTH TEXTILE EXPOSITION in October I will visit spaces No. 47 and 48 and see the machine in operation. In the meantime, suppose you dictate a letter to the manufacturers requesting them to send descriptive matter. It looks like that is just what we need."

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SIMPLEX ROLL CALENDERING MACHINE COMPANY
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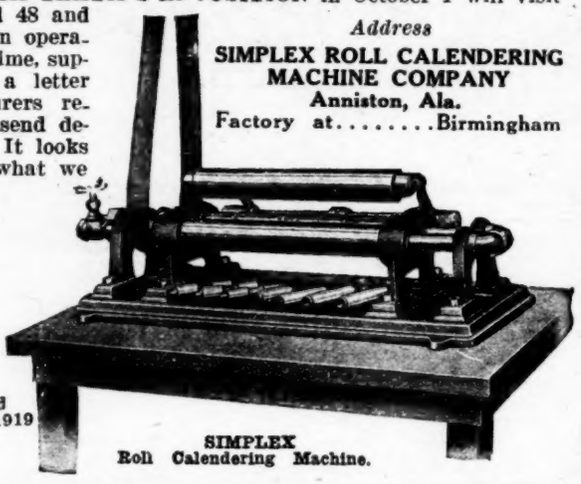

Patented
May 27, 1919

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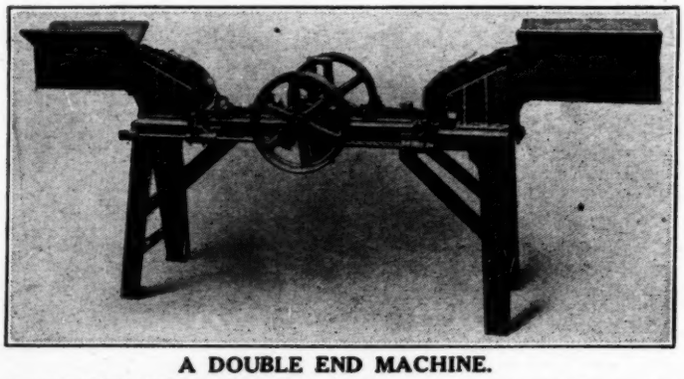

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THE PATENTED FEED DEVICE has been proven repeatedly to be the most rapid method of feeding QUILLS into a machine. It is simple and durable. The stripping blades are provided with a spring tension which does away with all small parts.

INTERCHANGEABILITY. The "UTSMAN" QUILL CLEANING MACHINE is so constructed that all parts are interchangeable. This enables us to carry a full stock of parts, which can be supplied on the shortest notice.

ITS FINISH. The "UTSMAN" QUILL CLEANING MACHINE is finished in red and green enamel, on top of two coats of filler paint. All steel parts are nickel plated. This preserves them from rust.

DELAY IS LOSS. "UTSMAN" QUILL CLEANING MACHINE will save its cost many times over. This is the experience of 170 mill owners who have had one installed. Profit by their experience. Let us install one for YOU.

A POSTAL WILL BRING A CATALOG.

The Terrell Machine Co., Inc., Charlotte, N. C.

plain order, and therefore the stress on these threads in the weaving process will be more than that on the remaining warp threads, all of which have considerably less interlacing to do with the filling. As a consequence, one might expect to have a greater percentage of breakages among these threads than among the others. For this reason, we have placed the binder threads on the front or first harnesses, for in this position the threads have a minimum distance to travel, and broken threads are more easily detected and repaired by the weaver than they would be if placed on any of the other harnesses.

Fig. 239 illustrates another excellent fabric with an extra warp figure developed on the drop principle. In this case, the color of the spoting threads is light brown, while that of the ordinary threads is light buff or ecru. It will probably be difficult to distinguish between these in the reproduction.

The ground or ordinary threads all weave in the simple 4 up 4 down basket or hopsack order as will be seen from the design N, Fig. 240, which shows one unit of the design on 76 threads and 64 picks. The solid marks again represent the spotting warp threads on the surface of the cloth. Each complete figure consists of three small spots. As in the last example, the spotting threads are not stitched at the back, but simply float loosely between successive vertical spots. This constitutes no defect, however, because such fabrics are not intended for purposes where both sides are exposed to view.

As will be seen from the draft at O, Fig. 240, only 6 harnesses are required for the loom; two for the basket ground and four for the two groups of three spots each. The weaving plan on 6 harnesses and 64 picks appears at P, but, in addition to these 6, there must be one or two more to form selvages or to operate catch threads.

There are 80 threads per inch in the warp, neglecting the spotting threads, and 80 picks per inch of filling in the finished cloth.

Alumina Soapalite.

Richer looking work, at a genuinely economical cost, is the claim for Alumina Soapalite, a chemical compound made by combining the oxide of metal aluminum with other minerals in such a manner that the resulting compoumd combines chemically with caustic soda. It derives its name from the fact that it is very similar to soap and will unite with soap in any proportion. It is a detergent in powdered form and is made for use in mill laundries, knitting mills having a finishing process for bleaching and dyeing, and other finishing establishments.

Soapalite is claimed to produce a liberation of alkali in such form that it converts all the oil and grease susceptible to such a reaction, on the other hand not injuriously affecting the cloth fibers. Fat soap gives up, when dissolved in water, either acid or alkaline salts, and the alkali of the alkaline salt does the cleaning. This alkali in the presence of greasy dirt combines with the greasy substances and becomes an inert salt when staurated with such matter Because of this, Soapalite is claimed to double the cleansing power of the best soap.

The best known method of removing the oily or greasy binder that holds dirt to cloth fabrics is to break it up into minute globules by emulsifying it and the proper amount of alkali to accomplish this action is important. Soapalite is said to have properties which improve the emulsification of the oily substances in cloth. It holds the caustic in combination with aluminum and other minerals until it actually comes into contact with the grease, and this enables the bleacher to put what is equivalent to a larger amount of caustic in the solution without running any risk of its attacking the fabric in process, and yet obtaining the benefits that would otherwise come from the use of free caustic. The precipitant produced by the action of Soapalite on the grease is a harmless white powder. This mineral detergent sustains a suds of a good body for dirt carrying and lubricating purposes and results in an easy rinse. It also brings out sharp clear colors, as more than the ordinary alkali is necessary for this purpose.

Soapalite contains about 35 per cent water, but it is claimed that this large amount does not interfere with its carrying more than double the caustic that a neutral soap carries, and when this additional caustic combines with the grease in the material under operation a soap is formed which has all the cleansing energy of a neutral soap.

The indications are that the use of Soapalite will materially improve the "feel" of goods, eliminate or very materially reduce the use of harmful alkalies and considerably lessen the use of expensive fat soaps. It is claimed to fill a long-felt need in textile finishing processes.

Alumina Soapalite is manufactured by the Electric Smelting & Aluminum Co., Lockport, N. Y. This company feels that such success in producing quality results has been attained in the laundering trade in the ten years that Soapalite has been on the market, that it has proven a good product for washing textiles, and they are, in consequence, perfecting the manufacturing processes by the installation of new equipment, and are increasing their manufacturing facilities so as to be able to substantially increase the output.

This company's chief chemist has recently spent a good deal of time investigating conditions in the textile field and has established a textile service department whereby the company is now in position to render helpful service to textile manufacturers who are interested in their products.

What Is Thrift?

Thrift is the opposite of waste.

It consists of wise spending fully as much as it does of saving.

When you practice thrift you do not throw your money away carelessly or foolishly. The result is that you have some of your dollars left for future use—just as a natural consequence.

The practice of thrift consists of knowing what you are spending and of what you are getting in return for the money you spend.

It also includes a record of what you have spent and what you are planning on spending.

Thus you have a plan or a system which guards you from reckless spending and foolish waste.

Thrift once practiced soon becomes a habit as easy to follow as are the habits of wastefulness and shiftlessness.

As a habit it brings peace of mind and a sense of security.—*Walton Spencer.*

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PITTSBURGH, PENNA.

Peoples' Bank Bldg.

New Plant for Artificial Silk.

Hopewell, Va., has been selected as the spot where the famous Belgian artificial silk industry will have its American re-birth. The former munitions town, cluttered with great plants, equipped with railroad sidings radiating in all directions just as they were needed and used during the war, with a splendid labor market still available, will thus remain on America's industrial map; and those who have made a study of its location and advantages claim that before many years have passed the site of every one of the old munitions factories will be covered with a textile mill of some sort.

The artificial silk mill which is now being erected is owned and will be operated by the Tubize Artificial Silk Company, makers of the most famous of the Belgian brands. To put the matter briefly, neither the artificial silk mills now operating in the United States, nor those in Europe, are able to supply the full demand of the various American industries which are using this product. The country's requirements are so great that the Viscose Corporation, which manufacturers the American silk from wood pulp in two plants, is planning to erect a third, and the DuPont interests, which are expert in the handling of nitrate cellulose products, have also announced their intention of entering the field. The new Tubize enterprise may be able to add enough to the total production to saturate the market—and it is nothing less than saturation that it needs if any number of textile branches are to be put in a position to manufacture the needed supplies at reasonable prices to the public.

Tubize artificial silk is made of cotton linters by the nitro-cellulose process. At present, all the material needed for its manufacture is bought abroad, most is still coming from the surplus war stocks of the Allies, the linters as well as the chemicals. All this will be changed, however, as soon as the first wheel turns at Hopewell. For months past, Belgian chemists have been in the United States, experimenting with American cotton and American acids. Their reports have been to the effect that these materials are in every way satisfactory—in some respects even superior to the European product. As a result, every ounce of the material needed for the American brand of Tubize will be purchased here, as much of the machinery as can be produced in the United States will be constructed here, the working staff will be recruited from the local labor markets—in fact, Tubize, so far as Hopewell is concerned, will be an all-American product.

In the meantime, experiments are now being conducted in the laboratories of the Belgian plant which, to some extent, will determine just how much artificial silk the United States will be able to buy in the future. At present, our various textile industries are using about 6,000,000 pounds per year. If it were advisable at this time to produce with the machinery on hand enough of the fine threads to meet the requirements of the underwear weaving lines and the ribbon trade, another 2,000,000 pounds could conveniently be added. To some extent, Tubize is resuming the production of these fine deniers. In the trade, they are known as 60, 70, 80, 90, etc. Even 35 is being turned out, but in limited quantities.

To get a close-up view of why there is a shortage of these threads, and of artificial silk in general in the United States, it is necessary to get information from the vicinity of the famous battlefield of Waterloo. Fifteen miles from there is located the main Tubize plant. During 1913-1914 this establishment sent 3,000,000 pounds to this country. Then, with the first shot on the other side of King Albert's border, production ceased abruptly and, with it, all exportation. But no sooner was the armistice a fact than the Belgians resumed the manufacture of the famous silken strands and in July, 1919, the first shipment since the war, about 10,000 pounds, reached the United States. Last June, the weekly importations climbed to 100 cases, or 22,500 pounds.

The speed with which this industry came back has often been commented on as one of the marvels of European reconstruction. There was a reason. Better than any other nation perhaps, they know what to expect once the enemy was on their soil. So they took time by the forelock as soon as the arrival of the invaders seemed inevitable, and buried about 3,000 tons of delicate machinery, motors, belting and other appliances and buried them so well that the Germans tramped right over the caches. When Belgium had been cleared of the last man in field-gray, these industrial treasures were unearthed, and while Tubize seemed to be in pretty bad shape generally, vats smashed, piping broken and twisted and some of the buildings half demolished, thousands of laborers were set to work and in less than a year's time Tubize silk was again in the American market. Today, almost full pre-war production is the rule. Five thousand operatives are turning out an average of 15,000 pounds per day.

Elsewhere, too, Tubize silk is being wound around the spindles. The great Belgian factory at Sarvar, Hungary, with its output of 7,000 pounds daily, had been seized by the Austrians as enemy property and was converted into a munitions plant. In a manner, this was a bit of good fortune for their owners, because it precluded destruction. So when the Austrians and their former dependents, the Hungarians, laid down their arms, it required but a few months' work to re-transform the machinery to its pre-war uses. Likewise at Tomazow, in Poland, where operations had to cease when the war started, full production has been resumed, 9,000 pounds being the daily harvest.

While the war was on, the United States was entirely dependent upon the American product, called Viscose. This, as was mentioned before, is a wood pulp product. It is being turned out by 4,000 hands in two plants. Some textile interests claim advantage for Viscose over Tubize. Others say that each has advantages over the other. The following table, giving the percentages of tenacity and elasticity of the two products, tells its own story:

	Per Cent Tenacity Dry State	Per Cent Tenacity Wet State	Per Cent Elasticity Dry State
Viscose	145	48	13.5
Tubize	170	65	13.2

This table is the result of tests made in the same room at a humidity of 65 per cent and temperature of 22 degrees Centigrade.

What the artificial silk industry in general means to the United States in dollars and cents, in tons and in pounds, has often been a matter for discussion. The sea-

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sons change the demand. Likewise, the upset of the war has been such that figures computed during the past four years tell a reliable tale. But a general idea of the country's immediate needs can be gained from the following tabulation:

Industry.	Average Consumption in Pounds per Month.
Sweaters	50,000
Neckties	20,000
Braids and trimmings	15,000
Mufflers	10,000
Tricolettes	100,000
Hosiery	200,000
Shirtings, etc.	50,000
Broad silks	50,000
Fancy weaves	25,000
Plushes	5,000
Carpets	5,000
Fringes, tassels, etc.	5,000

This makes a total of approximately 500,000 pounds per month, or 6,000,000 to 7,000,000 pounds in the year. And it does not include minor lines such as gas mantles, shoe laces, garters, elastics,

But for the fact that the present silk slump has somewhat decreased the normal demand for both the artificial and the real product, the aggregate present supply, furnished by the American, Belgian and other plants, would not meet the demand by thousands of pounds weekly. As it is, it barely answers requirements. However, reports from abroad indicate that quantity production is likely in the near future, but in the meantime, the United States will have to be satisfied to share the output with European interests which have standing contracts. Once operation is begun at Hopewell, the problem will be solved so far as this country is concerned.

No Metric System for Westinghouse.

The self named "World Trade Club" continues to stuff the mails with Metric System propaganda. If all the postal cards they have sent out could be showered over Washington from airplanes, quite a respectable snow storm with paper snowflakes might be obtained. In response to this flood of propaganda from the Pacific coast comes a business man's argument from the Westinghouse Electric and Manufacturing Company. We print it with pleasure and commend it to the earnest consideration of COTTON's readers and their representatives in Congress.

We quote:

"It is sometimes difficult to explain the obvious, all the more so when reasons for explanation appear unnecessary as well as approaching monotonous repetition.

"This is doubly true of the case against the adoption of the Metric System, whose use pro and con, has been expounded in all sections of the United States since the early part of the nineteenth century. At first, suggestions were quietly put forth regarding its supposedly simple characteristics. During the past few years, propaganda urging its general adoption has grown more aggressive until now the mails are filled with Metric literature. Bills have even been introduced in Congress whose passage would have meant that the use of any system of weights and measures other than Metric would have been illegal.

"In spite of all this urging there appears to be no general demand for the adoption of the Metric System in this country. The manufacturing plants which are using it are few in number and they are doing so under difficulties, while the great mass of people who are responsible alone for a system of weights and measures are scarcely aware of its existence. This cannot be attributed to ignorance for it is taught in all public schools. There is no "gag," for the statutes of the country legalized its use many years ago. If it has so many desired characteristics it would seem to the layman that the process of simplifying weights and measures was very slow.

"One of the reasons most commonly urged for the adoption of Metric units was that it would greatly aid foreign trade. That would appear to be inviting the mountain to go to Mahomet, for the greater number of manufacturing plants are located in English-speaking countries, where naturally the people use only the British system of weights and measures. Factories located in the United States, for instance, sell all but a small percentage of their goods in this country. It would appear then, that to sell a few articles to Metric countries, a certain class would make one hundred million people climb out of their accustomed channels to learn a puzzling unfamiliar language. Nor is this necessary, for the Westinghouse Company does a great deal of business with countries using the Metric system without difficulty or embarrassment.

"From stories sent out it would seem that all foreign countries with the exception of Great Britain were Metric. That this is not true is evident from the fact that even those which are out and out Metric, like France, Belgium, Denmark, etc., are more familiar with the English system than we are with the Metric. In Latin America some countries use a system of English extraction but with Spanish terms. Some use Metric and Spanish. Others use Metric alone, but they are all familiar with the English.

"No one doubts for a moment the tremendous difficulties that would be involved in making this country over into a Metric speaking and thinking people. These difficulties would multiply daily until nothing less than chaos would result. First, the greatest number of people in the country would have to learn the Metric tables. Then they would have to translate Metric terms into English before a ratio of values could be obtained. This in daily life where thousands of small transactions are carried on would be ludicrous. Imagine the mental calisthenics of a grocer should he suddenly be asked for .454 kilograms of butter or approximately one pound.

"A case in which Metric measurements complicate shop work has been recently acknowledged by an official of one of the largest tire companies in the world. His company recently adopted the Metric system and it is now partially used in all except the most recent factory which is all Metric. His words regarding the advantages of the system are interesting, particularly in regard to its use in the storekeeping and shipping departments. In the former, raw materials received in English units must be transferred into Metric units by production clerks before going to the workmen. Upon completion, the Metric article must again be converted into the English units, in order to mark

shipping weights. There are some departments of the Company which are still using the English system. More translation. This condition, the writer says, will last until the United States adopts the Metric system. Judging from past experience there will be a long wait.

"The Westinghouse Company has no desire to install a Metric translation department pending the adoption of the French system in America. It is a complex organization, highly detailed and a delay in any point of production, is felt in every department. Thousands of delicate, high-priced instruments are in daily use which the Company has no desire to scrap for Metric tools. There are also many tables computed in the English system which would have to be made over and in addition have a table of equivalents, practically tripling the labor used in making up tables as well as doubling their size. This paves the way for errors.

"Westinghouse, too, has little desire to install a school to teach its thousands of workmen the Metric system. The work entailed in this one item alone would be enormous, even if it were certain that employees could pick up the system rapidly. Others have not found this the case.

"These are, briefly, some of the reasons why the Westinghouse Electric and Manufacturing Company is opposing the introduction of the Metric system in America. Its advantages have yet to be proven in every way except theoretically and its practicability in the United States is uncertain."

Mill Man Turns Author.

William Crawford Burns, the author of "Pleading for Justice" is no mere theorizer, dreaming idle dreams about the working man's problems. He has known the hardships of labor, and the difficulties of modern business life complicated by the economic matters which he discusses. He was brought up on a farm in Banks County, Georgia, a district impoverished by the Civil War. When a little child he walked two miles to the country school, which held two terms of two months each year, between the times when farm work was least pressing. As cotton was then selling at a very low price, conditions grew steadily worse, and when the lad was eighteen, his father told him in despair that his only hope of education or advancement would be to leave home and shift for himself.

With less than ten dollars as his sole resources, he left home, and went to work as a fireman on a locomotive. He saved all that he could from his wages, till he had three hundred dollars, and with this he entered the Georgia School of Technology. During his vacations he worked in a cotton mill and after his graduation in 1905 he was made superintendent of the Rushton Cotton Mills at Griffin, Georgia.

In April, 1907, the mill was destroyed by a tornado and Mr. Burns was engaged to rebuild it, after which he went into the contracting business for himself. He made a specialty of post-office buildings, and worked in a number of different states. In 1916 he went to Los Angeles to superintend the erection of a large motion picture studio, which attracted him to the motion picture industry and brought him to New York. He has also been interested in the automobile sales business.

Mr. Burns was led to make a special study of living conditions in New York, particularly the housing problems, and has sought to devise some relief from the intolerable hardships entailed. His experience as a contractor had acquainted him with the injustice of the freight rates which discriminate against the rural sections and the interior towns in favor of large cities. The conclusions which he reached impelled him to write the book, "Pleading for Justice."

"Pleading for Justice" deals with the railway problem and especially with discriminatory freight rates. It is written in the form of a story, with a message for thoughtful readers intertwined in the romance. The method of handling and the style shows the inexperienced writer, but the message comes "hot off the bat" as the author sees it. The book is published by the Justice Publishing Company, 1465 Broadway, Suite 402, New York City. Price $2.00.

Our Merchant Marine.

It was not unusual in early days to reckon the wealth of American states by the number of seagoing ships they owned, just as today the number of automobiles owned in proportion to a state's population is accepted as an indication of prosperity.

Thus in the year 1770, Massachusetts was reputed to have owned one seagoing ship for every 100 inhabitants. At that period according to "America's Merchant Marine," a study by the Bankers Trust Company of New York one third of the vessels flying the British flag was American built. By 1800, the United States with a population of 5,300,000 possessed a merchant marine of 972,402 tons, or one ton of shipping for every six inhabitants.

This high ratio of tonnage to population was practically maintained up to the period of the Civil War when, with more than 5,000,000 tons of merchant shipping, the United States was the world's second maritime nation. In 1861 America had 2,496,894 tons of shipping engaged in the foreign trade alone, compared to Great Britain's 3,179,683 tons.

These figures indicate that the present position of the United States as a close second in world maritime standing is not new to history. It is merely a revival of America's old time shipping prestige. The new phase is the rapidity with which that prestige was revived as indicated by these figures from the Bankers Trust Company's study.

In June, 1914, the United States possessed only 2,027,000 tons of seagoing ships. Five years later, in June, 1919, the American tonnage of seagoing vessels was 9,743,000. During these five years the world's output of ships was over 14,000,000 tons and the United States alone produced more than half of that tonnage.

It is announced that Carlisle & Gale Company have moved their business from East Cambridge, Mass., to 561-575 Albany St., Boston, 18, Mass., where they will have increased facilities and be better equipped for the manufacture of exhaust and blow pipe systems and general sheet metal work.

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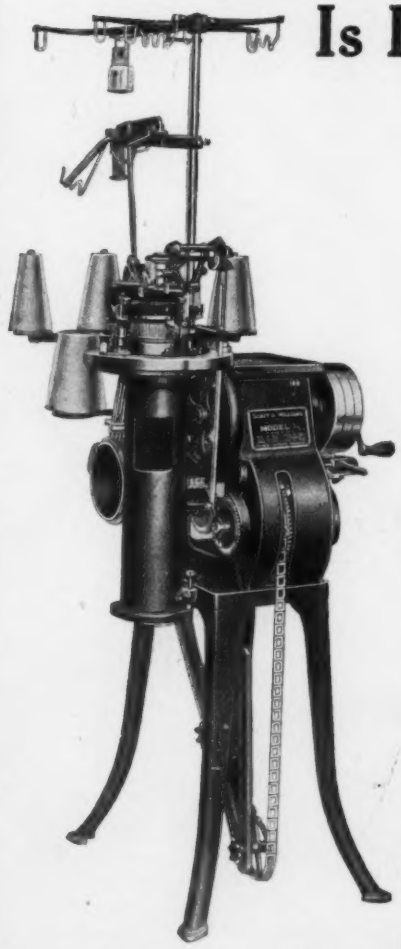

Producing a fabric without lines, using a latch needle, permitting speed of production, the making of heavy heels and toes and perfect plaiting.

Increased width of top and a greatly pronounced loose course for looping are features of great value.

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More than two-thirds of the knit underwear manufacturers in the United States and Canada are now using the Flatlock machines.
Their selection of this machine has been based on sound business policy.
These men have found that they can conserve valuable floor space, produce more and better work by using the

"FLATLOCK" machine
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They have found that underwear finished with the Flatlock sells more readily and commands better prices.
We do not ask you merely to take our word for this. Our demonstration office is open to any manufacturer who is interested. Let us prove to you beyond a doubt that th use of Flatlock machines will increase the quantity and improve the quantity of your output.

The Seam that sells the Garment
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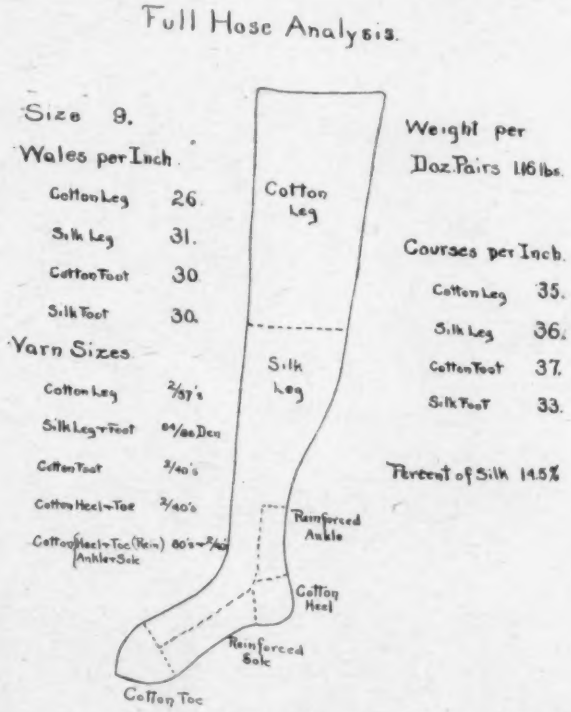
Hosiery Analysis

BY G. R. MERRILL.

When making any analysis requiring the destruction of the sample, care is necessary in collecting the data making up the analysis. The various details should always be arranged in such order, that all of the items regarding the sample as a unit be ascertained before any part of it is drawn out of its normal shape, or is separated from it. The destruction of the sample, as a unit, to determine the characteristics of its component parts should begin, only, after all of the data which it is possible to collect from it in its normal condition is obtained.

To illustrate this article with a concrete example consider a full hose, the upper portion of the leg being cotton and the lower portion all silk, the heel and toe entirely of



cotton and the back of the ankle, the heel, the sole and the toe reinforced with a cotton thread.

The right items to determine are the weight per dozen pairs and the size. The weight per dozen pairs is obtained by weighing the sample (single stocking or pair) and multiplying the weight by twenty-four or twelve to get the weight of one dozen pairs. The size is determined by measuring from the point of the toe to the center of the curve around the heel. On seamless hosiery, this point is along a continuation of the line caused by the fashioning of the heel.

After collecting the foregoing data, determine the courses and wales per inch in each portion of the stocking. In this case, find the courses and wales per inch in the cotton portion of the leg, the silk portion of the leg, the cotton portion of the foot and the silk portion of the foot. In determining the wales and courses per inch have the goods as near their normal condition as possible. Above all, do not stretch the material in a manner which will spread the wales or courses apart. Where it is possible, count the wales or courses over two or three inches, to make slight discrepancies less probable, and then check the number per inch thus obtained by counting two or three other places for an inch each. If the number per inch is counted, use at least three places and average the figures thus obtained for the final figure. When counting wales, it is best to count along one course, and when counting courses, it is best to count along one wale.

When a full-sized diagram of the stocking is made, it is not necessary to determine measurements of the sample, but if it is not either full-sized, or to scale, the analyst should measure the top of the leg, the ankle and the foot.

Up to this point, the sample is still intact. All of this data is obtained without drawing the sample out of shape or separating any of its parts.

The next step is to determine the yarn sizes. This involves a raveling of the sample, so, always be sure that all other data as obtained before starting on this step. For most full fashioned hose (i. e. excepting the Burson type) the seams must first be ripped. With a small pair of scissors or a sharp knife remove the stitches which hold the selvage edges together down the back of the leg and in the foot. Then, cut the stitches where the toe is closed. Seamless hose which has a machine seam in the back, after a bit of careful ripping, becomes an ordinary seamless stocking, in which it is necessary only to open the toe where it has been closed in looping.

Where it is possible, it is best to ravel the sample directly onto a reel and so measure the length obtained. Where there is more than one strand, it is usually possible to reel them in separate skeins. The yarn from each portion of the sample should be sized separately, as there are often different yarns used for each portion. Sometimes, however, it is impossible to determine very accurately the size of a reinforcing yarn because short lengths, only, can be obtained.

Knowing the length of the yarn of each kind, it is only necessary to weigh each length to determine the size.

In many cases, it is necessary to determine the percentages of different fibers, as certain customs regulations are based on the percentages contained. Where the analysis is for comparative purposes, this item is of considerable importance.

An example of an all cotton half hose analysis is also given. There are but few points wherein it differs from the full hose.

The cuff, of course, being a ribbed fabric, is different than the body of the stocking and as a rule is transferred to the machine making the leg, heel and toe.

Where an analysis is made to give data necessary to reproduce a given piece of hosiery, the following items must be found, as nearly as possible, in addition to those things previously mentioned:

Style. Full fashioned or seamless,
Gauge of machine, or needles per inch,
Number of needles used,
Diameter of cylinder (if seamless).

ALWAYS FIRST WITH THE LATEST

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FULL AUTOMATIC

HOSIERY MACHINES

SIMPLICITY — SPEED — PRODUCTION — QUALITY

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ALL STYLES

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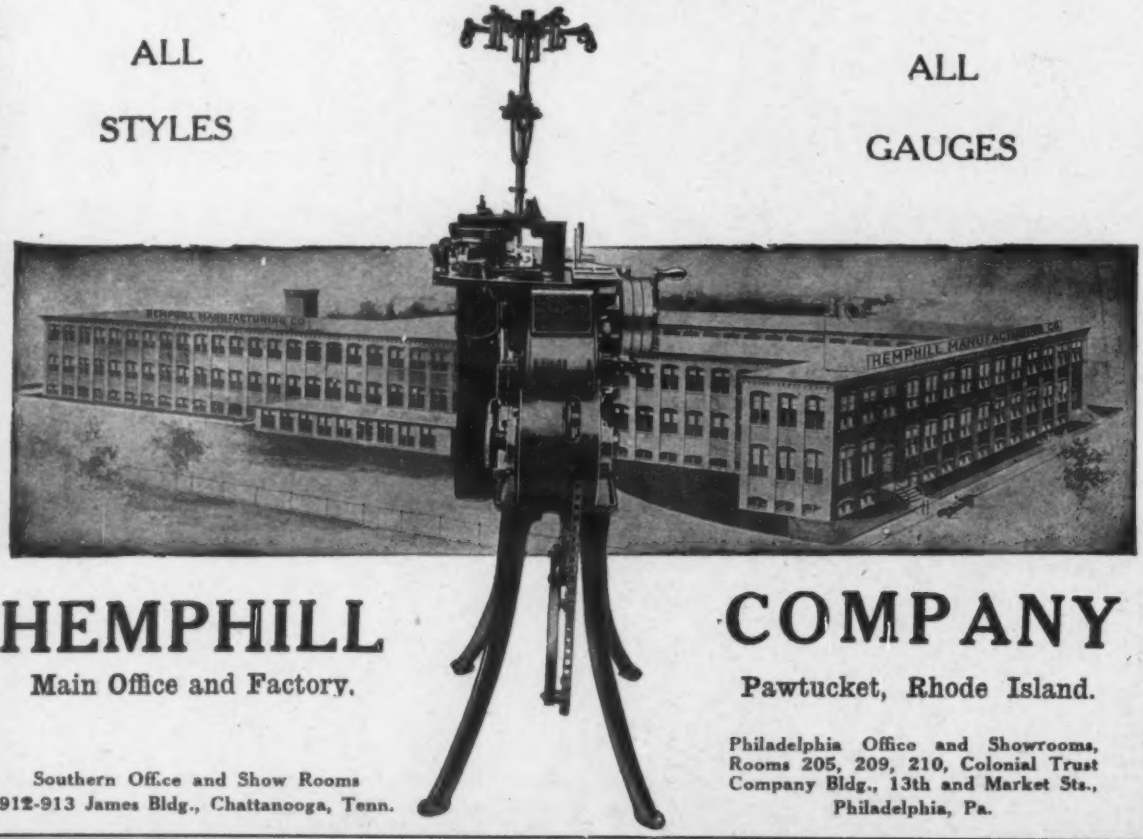

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The question relating to seamless and fashioned stockings is easily settled.

The gauge of the machine, or needles per inch, must be estimated and although there are rules used by some men, the results obtained are usually tempered by experience. Experience, in the final analysis, is probably the most common factor in setting this question.

The number of needles used is found by cutting the wales around the sample.

Where the hose is of the seamless type, the diameter of the cylinder should be estimated. If the needles per inch are estimated correctly, the number of needles used, divided by the needles per inch, should give the circumference of the cylinder and that divided by 3.1416 will give the diameter, which is the term used in designating cylinder sizes.

Half Hose Analysis.

Weight per doz. pairs	1.125 lbs.
Wales per inch leg and foot	27.
Wales per inch cuff	19.
Courses per inch leg and foot	32.
Courses per inch cuff	33.

Yarn Numbers.

Toe yarn	18's
Leg, Foot and Heel	18's
Cuff	16's
Toe and Heel (reinforcing)	50's
Sole (reinforcing) (estimate)	50's

The Permutit Company, 440 Fourth Ave., New York, has just issued general bulletin No. 101, covering the various products manufactured by this company. This booklet, containing thirty pages printed on special stock and in an attractively embossed cover, is a very complete dissertation on water rectification or conditioning problems and their solution. It takes up in detail the process by which water is filtrated and sterilized in Permutit apparatus, and treats separately each field to which this apparatus may be applied. This system is used in textile mills in the soaking, degumming, bleaching, scouring, dyeing, finishing, etc., where water that is neutral, absolutely soft, iron free, and sparklingly clear is necessary. It also finds application in the mill village laundry. The booklet may be had on request.

Among the Knitting Mills.

The Paducah (Ky.) Hosiery Mills Company will erect a one-story and basement, 82 x 110 feet, plant addition.

The Dayton (Tenn.) Hosiery Mills have under construction a new one-story and basement building, 40 x 80 feet, to cost about $10,000. It will be used in connection with the employees' welfare department of the mills.

The Floradel Knitting Mills, New Orleans, La., have started construction on a mill at that place. The company is headed by H. B. Kaufman. The building and equipment will cost approximately $100,000 and operations will be begun with 35 knitting machines.

The Moorhead Knitting Co., Harrisburg, Pa., has filed notice of an increase in its capital stock from $1,000,000 to $5,000,000.

The Modern Textile Co., Harrisburg, Pa., has filed plans for the erection of a one-story brick building at its plant, to be used for garage service.

The Lebanon Mill Co., Pawtucket, R. I., manufacturer of knit goods, has started work on the proposed two-story addition to its mill, 50 x 90 feet, to cost about $45,000.

The Florence Knitting Mill, Philadelphia, Pa., will make improvements and alterations to cost about $4,000.

The Glenn Knitting Mills, Philadelphia, Pa., have awarded contract for the construction of a new four-story mill, 93 x 159 feet, to cost about $190,000.

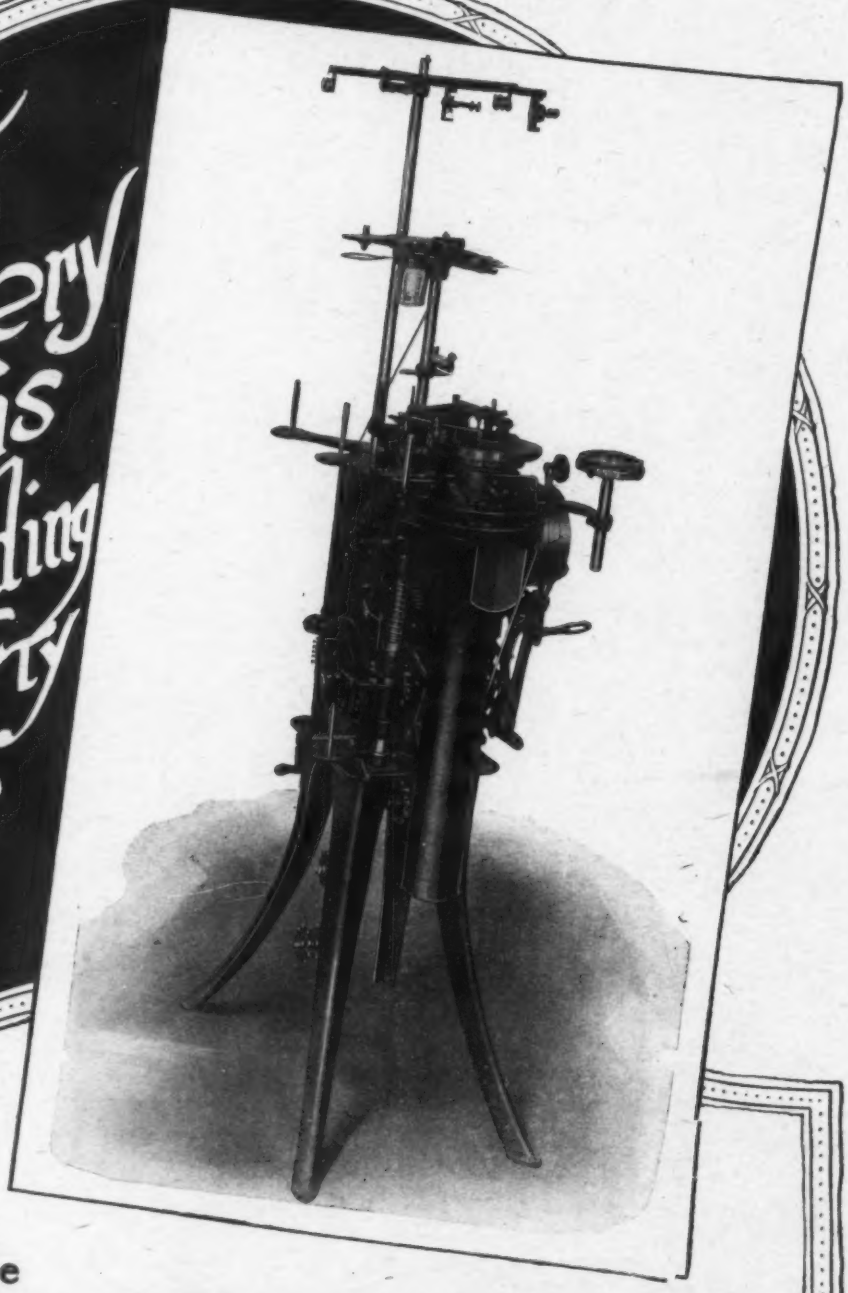
Spiker & Lose, Engineers.

Back in 1919 William Claer Spiker, a civil engineer (Cornell 1900) of several years experience, opened an office in Atlanta. During the next ten years he designed and supervised the construction of many large buildings and bridges in different sections of the South, the total of this work aggregating many millions of dollars. Practically the entire year of 1919 was devoted to working out the plans for concrete ships for the Government, Mr. Spiker being chief designing engineer of the concrete ship section of the United States Shipping Board—Emergency Fleet Corporation.

While on this concrete ship work for the Government Mr. Spiker was associated with R. G. Lose, an engineer who had received his early training with the McClintic-Marshall Construction Co., and the Reinforced Concrete Construction Co. For ten years before entering the Emergency Fleet Corporation he was connected with the Carnegie Institute of Technology, also conducting a consulting practice, being associated with a number of the leading architects of Pittsburgh.

Recently Messrs. Spiker and Lose opened offices together in Atlanta and since the combination have been engineers on the following work: Addition to Federal Reserve Bank Building, Atlanta; Howard Theatre, Atlanta; George Muse Building, Atlanta; Metropolitan Theatre Building, Atlanta; Southern Bell Telephone & Telegraph Company's new buildings at Columbia, S. C., Atlanta, Ga., Shreveport, La., Miami, Fla., and Key West, Fla.; five warehouses for the Atlantic Ice and Coal Corporation; a warehouse for the Georgia & Alabama Warehouse Co., at Rome, Ga.; and a dam for the High Shoals (Georgia) Mfg. Co.

The Hosiery Buyer is Demanding QUALITY



This Superior Machine Produces the Highest Quality Fabric Free From Lines

The hosiery buyers of today are demanding the highest quality they can buy,—if you can't supply them, they'll buy somewhere else.

There are different makes of knitting machines on the market, producing good fabric, but everyone knows the advantages of the spring needle machine for knitting hosiery, especially when using silk, and everyone knows that to make the finest and smoothest fabric free from any trace of imperfections it takes a WILDMAN Spring Needle Knitter.

The product of this machine finds a ready sale and a better price for the goods.

Get into this exclusive market—supply the demand for quality goods—by installing the WILDMAN Machine.

Write today for details.

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WILDMAN

SPRING NEEDLE KNITTER

MFG. TRADE MARK

Two Meetings of Southern Knitters

Southern manufacturers of knitted goods, in meetings in Charlotte, N. C., on September 15, and in Chattanooga, Tenn., two days later, were heard from in no uncertain tone on the causes of an artificial condition under which American industry is nearer a stage of complete stoppage than ever before in the recollection of perhaps the oldest person living, whose best years were given over to business pursuits. The Federal Reserve Board was charged with the responsibility for the prolonged depression in industry, and the broad intimation was given that the Board had favored large financial interests, to the great gain of the latter, and had promoted a species of propaganda which could have had no result other than that which culminated in the closing of hundreds of textile factories, forcing into idleness many thousands of wage earners and bringing large industrial and commercial interests to the verge of bankruptcy. Declarations to this effect were made in the meeting which was held in the hall of the Chamber of Commerce of Charlotte on the 15th, when representatives of approximately 100 knitting mills in the Carolinas and Virginia assembled and organized the Southeastern Division of the National Association of Hosiery and Underwear Manufacturers.

Major A. McDowell, president of the Scotland Neck Cotton Mills, Scotland Neck, N. C., led the attack on the deflation trenches in the Charlotte meeting and was ably seconded by Champe S. Andrews, Cotton States Hosiery Mills, Chattanooga, Tenn. Both were equally conspicuous in the meeting in Chattanooga, and the movement which was launched in the hope the Federal Reserve Board might be persuaded to "call off its dogs" instantly spread to the tobacco growing interests of the South and to the organized cotton interests.

The Meeting in Charlotte.

More than fifty manufacturers responded to the call for the meeting in Charlotte to discuss trade conditions and a possible remedy for industrial distress. R. L. P. Reifsneider, representing the National Association, organized the meeting and, on motion of Major McDowell, was made the permanent presiding officer, in the absence of J. F. Taylor, Orion Knitting Mills, Kinston, N. C., who was elected unanimously, by a rising vote, president of the Southeastern Division, comprising North and South Carolina and Virginia.

The keynote of the deliberations of the meeting was sounded with the reading of an extract from a letter from one of the large southern knitting mills, in which it was stated in part: "It is quite apparent that if conditions continue as they are the losses to the entire cotton and woolen industries of the country, and to labor as well, will be appalling, running perhaps into billions of dollars. The Federal Reserve Bank was organized to avert just such a condition as prevails, whereas it is being used to bring about the very conditions that it was intended to avert. Unless the Federal Reserve Bank governors can be persuaded to reverse their program and let the law of supply and demand govern these matters there can be no estimate of the damage that will be done and already has been done."

This reference to the Federal Reserve Bank brought Major McDowell to his feet. In an impassioned address the Major, instancing the idleness of hundreds of factories and many thousands of toilers as evidence that commerce was out of joint with the financial situation, with an abundance of capital and no lack of brains for its profitable employment, charged there had been inexcusable blundering, to take the most charitable view possible. His remarks punctuated two letters which he read, the more striking points in which were emphasized as he digressed from the reading of the letters to make additionally forceful the sentiment which he had started out to convey, for enlisting the co-operation of manufacturers and distributors generally. The Major's letter to Governor Harding of the Federal Reserve Board follows:

Scotland Neck, N. C., Sept. 6th, 1920.

Hon. W. P. G. Harding, Governor,
Federal Reserve Board,
Washington, D. C.

Dear Mr. Harding:

For some time I have felt inclined and at last have determined to write you my views regarding the attitude of the Federal Reserve Board for the past several months in a very strenuous and disastrous effort to deflate the general commodity market. The writer was in New York last February (I think it was), when the New York banks importuned you to force the liquidation of cotton loans in the South, and I well remember your prompt refusal to attempt anything of the kind. Moreover, it was only a short time thereafter when you came out with your first interview in which you stated that deflation in all or practically all commodities must take place, and speculation in all forms must be reduced as far as possible, and forthwith began a policy including propaganda which could only have the effect of frightening timid merchants, manufacturers and distributors to bring about the deflation which you had previously announced must take place. There is abundant evidence that this policy is just what was wanted by the larger financial institutions of the country. They will nearly all tell you today it is just what was needed—indeed, was a necessity, and was not started a moment too soon. It does not take a close student of finance to tell why the larger financial interests wished this to be accomplished. But it does puzzle nearly all thinking men, who do not belong to that group, to even remotely guess why the Federal Reserve Board is willing to lend its support to and actually further the ruinous policy above described.

You must bear in mind, Mr. Harding, that the average man does not study, nor even seriously think for himself, on subjects of this sort. The heads of the large financial institutions do the thinking, and the word is simply passed on, and the average deluded citizen is made to feel that this policy, which is rapidly destroying all confidence in not only his own business, but that of almost every other branch in the entire country, is the only thing that will save him along with practically all the rest from utter ruin and financial bankruptcy. The country at large is now beginning to realize that such a policy will soon (if it has not already done so), wipe out not only the profits of the past few years, but in thousands of cases the earnings of a life time. As the situation grows more serious,

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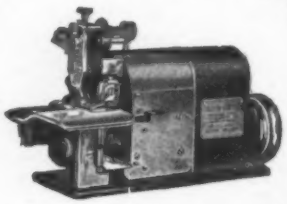

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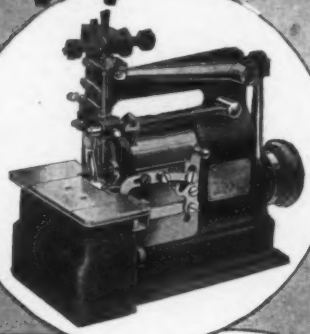

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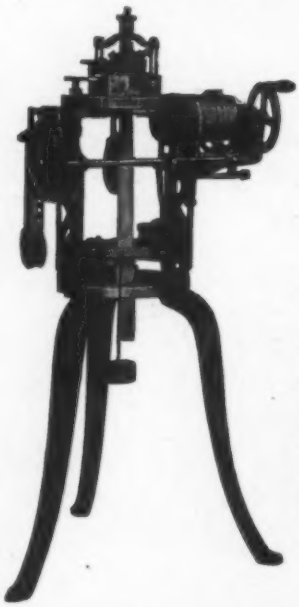

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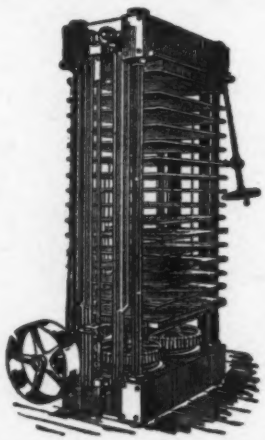

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and they are forced to at last stop and think, they suddenly realize that in the discussion of the passage of the Federal Reserve Act years ago, the more important financial institutions looked with decided disfavor upon the proposition. They will also realize that the paramount contention of its friends was that it would greatly develop, aid and even promote commerce, and in times of real disaster would be so elastic it would save every legitimate business from serious suffering, much less total destruction. The people were even deluded into believing that the Federal Reserve Board was actually created to help them, and never dreamed it could lend its aid to any policy which would soon, if persisted in, actually destroy them.

Personally, Mr. Harding, I believe inflation, as it is commonly spoken of, was brought about by natural causes. Five years of war caused nothing but destruction in Europe. All reserve supplies of every character were completely exhausted, and the total cessation of production over there only intensified the call upon America for goods of every nature. This insatiable demand, together with our own intense effort to increase production as well as the almost super demand of our Government for both men and material, readily account for the rapid rise in the price of all commodities. Granting this condition to be true, (and it can not be denied), then the high prices here were natural—indeed, inevitable. If let alone, these very high prices would have declined by the same process only reversed. Production would have in a reasonable time caught up with the demand, and then the prices would have gone down slowly and many a worthy business would have been saved from almost if not entire destruction. Thousands of retail merchants, jobbers, manufacturers, land owners, and even artisans who have laid aside small savings from their earnings, would have been saved from total loss. There has been a clamor for lower prices, but it emanated largely from high places, and when it came from other walks of life, it was largely due to too much confidence on the part of the public in the wisdom of those from whom it got its first inspiration. Of course the price of some commodities went too high, due largely to speculation, but there is always some evil in everything. A careful investigation by those in authority could have located most of these and soon have eliminated them completely. The grave uncertainty of when the present policy your Board is pursuing will finally be changed has already closed many an industry and has seriously affected every branch of commerce, except those supported by powerful financial backing. Is it not quite time, Mr. Harding, that you call a halt to your policy and take the initiative to end it all and let the country know that from now on business will follow the legitimate channels and be influenced entirely and only by the question of supply and demand, and not longer be bankrupted by, not alone the support of, but active leadership of the Federal Reserve Board, that institution the people (not the large financial institutions) so earnestly supported and loudly clamored for during the uncertain period of its formation? The day the Federal Reserve Act became a law, those of us who read and think for ourselves rejoiced that the time had at last come when no man nor group of men could raid our business and destroy it as had so often been done before. Think and think quickly, Mr. Harding, over the situation as it exists today, and if you will change your policy, many thousands of honest and worthy business men can be saved from utter ruin. Tremendous harm has already been done and many a deserving man has been reduced to penury. But it is not too late, if handled quickly, to save many thousands who have not yet lost their all. It is a grave situation and demands serious thought, but also requires speedy action.

Personally, I have been a manufacturer of cotton hosiery for thirty years and in all these years I have never seen business so paralyzed. Indeed, the result from the panics of 1893, 1907, 1914 and 1918, all combined, was not so disastrous as has been brought about by the process of deflation by the Board of which you are the head. What a travesty you have wrought with a very institution we thought was established to take care of us in periods of necessity. The only reason you have not been deluged with letters and appeals long ago is because the rank and file of the people have been misled into believing this policy was a necessity, and that you were all patriotically doing your part. It emphatically is not, and has never been, a necessity. On the contrary, it is exactly the opposite of what should be done, and the more quickly you change this policy, the more good you will do to the people at large. If speculation had become too rampant, it could have been stopped or reduced by the bankers themselves. The public are gradually beginning to realize that your policy is the wrong one for their good. So let me beg of you that you make haste to change before this fact dawns upon the rank and file, or else an indignant public may start a complaint that will spread until it finally ends in a cataclysm for your Board.

I hope, Mr. Harding, you may see the matter from the viewpoint of the public and give us a policy which will give us a quick relief.

Yours truly,

(Signed) A. McDowell.

With a view to bringing his letter to the Federal Reserve Board to the attention of distributors of textile manufactures, Major McDowell transmitted a copy to the Southern Wholesale Dry Goods Association and caused a copy to be sent also to the National Wholesale Dry Goods Association. His letter to the southern association, which was read to the meeting and received the same favorable comment as that accorded to the appeal direct, was as follows:

Scotland Neck, N. C., Sept. 9, 1920.

To the Members of the Southern Wholesale D. G. Association:

Gentlemen:

At your last annual convention in Dallas, Texas, I had the honor of reading a paper on the hosiery market, present and prospective. Those of you who were present will probably recall I took rather a hopeful view, and prophesied at least three years of good business. How terribly disappointing the result has been most of you know, not alone from the fearful shrinkage in values you have had to sustain, but a serious let-up in business activity as well. The downward trend of the market, as well as the almost total cessation of business, both speak eloquently of the power of the combined influence of the great financial institutions together with and under the leadership of the Federal Reserve Board. If business had been permitted to continue under a careful watch to eliminate

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50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

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speculation as far as possible, I have no other idea than that we all would be doing an entirely satisfactory as well as prosperous business.

In the opinion of the writer the attitude of the Federal Reserve Board, aided by the really big financial institutions of the country, accounts entirely for the failure of our forecast in May to materialize. We feel that this policy is not only disastrous but inherently wrong, and we have written our views to Mr. Harding, a copy of which is herewith enclosed, and suggest that if after considering the matter fully you agree with us, you not only write Mr. Harding but also your Representatives and Senators in Congress and urge them to do likewise.

No man can foretell the end unless this policy is changed and changed quickly. The Federal Reserve Board has already advised us that the decline so far is not comparable to what is going to happen in the coming months. Are you going to sit still and let the very institution that was established to prevent ruin and disaster take the leadership in a policy that can have no other end? A righteous indignation of the public is the only thing that can prevent further raids upon business, and this letter is written not only to give you the reason why our prediction of last May failed to come true, but in the earnest hope you may join us in an active effort to impress the Federal Reserve Board that the people desire its policy changed and changed without delay.

Yours truly,

(Signed) A. McDowell.

Champe S. Andrews, in response to a call for his views, arose reluctantly, as he had been scheduled to speak in Chattanooga on the same subject two days later. He predicted the pioneer movement inaugurated by Major McDowell would be met with a hearty response and pleaded for individual and organized effort on the part of the manufacturers assembled to continue the work begun by the major, who had shown a boldness and courage of conviction that furnished an inspiration for all.

Mr. Andrews again championed the cause of the Golden Rule in business and urged those present to join in the movement for universal commercial arbitration for averting litigation and promoting amicable adjustment of disputes between seller and buyer. It was prophesied that any manufacturer or distributor—individual, firm or corporation—who refused to subscribe to such a plan for terminating controversies would not be in favor among those who stand for a "square deal." Instances of harmonious adjustment of several recent controversies were cited by Mr. Andrews for illustrating the feasibility and practicability of arbitration.

After several other speakers had been heard on the subject of Major McDowell's letters and his inspiring address the following was adopted by a rising vote, every man in the room remaining standing until the result was announced from the chair:

Resolved: The Southeastern Division of the National Association of Hosiery and Underwear Manufacturers in session at Charlotte, N. C., deplores the widespread feeling of pessimism as to the future of American industry, a pessimism that is proceeding along a path, which if unchecked will be strewn with financial wreck and ruin.

The ruin will be wrought not only from our manufacturing structures, but from the establishments of distributors and wholesalers, and from the sinews of labor as well.

We believe this threat to our safety and solvency is traceable directly to the policy of the Federal Reserve Board in its constant preachment of the necessity for deflations—a deflation that all agree is wise and beneficial if brought about by the operation of supply and demand instead of by propaganda from high places, undermining the confidence of the entire country in conditions which, without false preachment, are essentially sound and reassuring.

That we protest against a continuance of the policy by the Federal Reserve Board, and demand an immediate pronouncement from the Federal Reserve Board that will halt the fears they have engendered, and prevent the sacrifice of all business values at prices determined by forced sales and impending insolvency.

Commercial arbitration was favored unanimously, in the adoption of the following:

"We endorse unqualifiedly the idea of bringing about universal adoption of commercial arbitration, and we commend the National Association of Hosiery and Underwear Manufacturers for its efforts to secure action to this end by the various elements of the textile industry, from the manufacturer to the retailer."

The National Association also was commended for its "vigorous and effective opposition to the federal dye license bill," and was congratulated for "having been largely instrumental in preventing the passing of the bill up to the present."

The resolutions were reported by a committee consisting of Champe S. Andrews, chairman; J. H. Adams, High Point (N. C.) Hosiery Mills, and George F. Seyffert, Elizabeth City (N. C.) Hosiery Company.

A report was submitted of a proposal of railroad companies to reclassify cotton waste, for putting it in a commodity class under which the freight rate would be increased and waste would have to be so compressed as to partly destroy its commercial value. The committee on resolutions considered the matter and reported the following, which was adopted:

"The utilization of waste is an economic duty as well as a necessity. We are in sympathy with the general desire of business men to permit the railroads to increase their rates enough to preserve railroad investments on a favorable basis; we are opposed to the effort to put cotton waste from the sixth classification to the second and to the rule requiring that waste shall be compressed to a 12 lb. density. These rules will destroy the value of cotton waste as a commercial by-product and are opposed to all sound economics and in violation of the principle of conservation."

The following declaration, a copy of which was forwarded to J. F. Taylor, president-elect of the Division, was unanimously adopted by a rising vote:

"We congratulate the Southeastern Division of the National Association of Hosiery and Underwear Manufacturers on the selection of J. F. Taylor as the President of the District. Great good can be accomplished by the earnest cooperation of the men in the same craft and industry for the general welfare. The time is ripe for the manufacturers of hosiery and underwear in this district to stand together for sound economical principles and for the fur-

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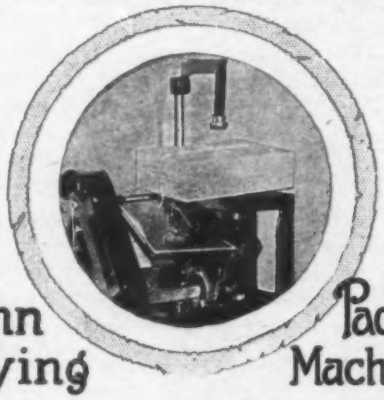

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therance of the general prosperity of the industry. All that is needed is competent leadership, and this is guaranteed by the selection of Mr. Taylor, to whom we pledge our heartiest assistance and to whom we extend our congratulations on his election to the presidency of this district. We recommend that the new president prepare a budget, to provide for the expenses of the district for the next year, and levy an assessment to cover the expense on the basis of the capital stock of each member."

That the depression and stagnation attributed to the deflation policy of the Federal Reserve Board has been felt in the knitting industry throughout the country was reflected in a composite report from hosiery and underwear mills variously located and selected at random, showing that more than 50 per cent of the factory equipment was idle in August, with many mills closed down throughout July and more becoming idle from day to day. This report was amplified by statements of manufacturers at the meeting, which adopted the following, at the recommendation of the committee on resolutions:

"Since it is conceded that the causes operating have made for an overproduction, so called, of practically all classes of hosiery; that it seems unwise to make up and carry in stock any considerable quantity of merchandise, and that the confidence of the jobbers must needs be restored by limiting production to the present and known needs, therefore, be it

Resolved, That we strongly urge all our members and other manufacturers to limit their production to cover only their sales from period to period."

With the manufacturers in the Carolinas and Virginia organized as the Southeastern Division, it is expected they will begin cooperating with the Southwestern Division, comprising the states of Alabama, Georgia, Kentucky, Louisiana, Mississippi and Tennessee, so soon as President Taylor of the Southeastern names a secretary and his working committees. The Charlotte meeting was regarded one of the most important, from the standpoint of far-reaching results, yet held by southern knitting interests.

The Meeting at Signal Mountain.

A half hundred and more knitting manufacturers representing Alabama, Georgia, Kentucky, Louisiana, Mississippi and Tennessee met at Signal Mountain Inn on September 17 and, by means of a questionnaire circulated among those in attendance, obtained a very practical view of mill conditions, present and prospective. Thirteen questions were submitted. A compilation of the returns shortly before adjournment showed:

1. Are you receiving new orders at satisfactory prices? Yes 2; No. 45.

2. Have you completed your old orders? Yes 30; No. 9.

3. If not, how long will they last? About 10 days, average.

4. What percentage of your output are you selling? Average about 12 per cent.

5. What is the percentage of your knitting and looping now as compared with your normal production? An average of 60 per cent.

6. Are you running to use up old supplies of yarns, etc? Yes 39; No. 9

7. How long will your supplies of yarn last at your present rate of consumption? Four months, average.

8. Are you purchasing yarns in order to continue operations? Yes 2; No. 43.

9. Do you think there is an over-production of most lines of hosiery? Yes 39; No. 9.

10. Do you think the demand for hosiery between October 1st, next, and January 1st, will be sufficient to prevent a further accumulation at the mills? Yes 10; No. 39.

11. Do you think that when business revives there will be an over-supply of hosiery to meet the demands of buyers? Yes 39; No. 10.

12. Do you think that when business revives the urgency of sellers will result in ruinous prices? Yes 30; No. 11. (Remainder not answering.)

13. Do you think that curtailment of production to date has been sufficient to prevent an over-supply of hosiery when business revives? Yes 6; No. 40.

Champe S. Andrews, the father of the movement for commercial arbitration, reported that the Southern Wholesale Dry Goods Association had subscribed to the plan, the groundwork of which is embodied in the following; to be stamped or printed on contracts:

> All differences arising out of this contract shall be settled by arbitration, the parties agreeing to submit their differences to any recognized standing Board of Arbitration satisfactory to both parties, or, if they cannot agree on such, then the seller shall select one arbitrator, the buyer another and the two so selected shall choose a third. The award of the arbitrators shall be final.

After a report by Mr. Andrews on the feasibility of organizing a cooperative export department within the Southwestern Division of the organized manufacturers the following, on motion of W. B. Davis, who was seconded by T. H. Johnston, was adopted:

> That the Southwestern Division approve the report of the special committee on the cooperative export department; that members of the Division be authorized to buy for export under the Webb law or in any manner that seems advisable; that details of the export organization be determined upon by those members desiring to enter the combination; that Champe S. Andrews be entrusted with the organizing of the export department; that any member of the Division shall be eligible to participate in the project, and that $250 be appropriated for the purpose of bringing the matter to the attention of the National Association.

The resolution adopted in the meeting in Charlotte, N. C., on September 15, in relation to cotton waste, was adopted also by the Chattanooga meeting and copies were directed to be sent to the Tennessee, Chattanooga, Alabama and Georgia Manufacturers' Associations.

Reports from the manufacturers present showed that their combined production of hosiery in August was 425,000 dozens less than in January.

C. B. Paulus Still in Needle Business.

We are advised by Charles B. Paulus, 1516 68th Ave., Oak Lane, Philadelphia, well known selling agent of latch needles, transfer points, sinkers, etc., to the knitting trade, that there appears to be in circulation an erroneous report to the effect that he has given up the latch needle business and gone exclusively into the chemical business. Mr. Paulus states that he is now in the needle game stronger than ever before and we are glad to make this statement to aid in setting aright anyone who may have heard such an erroneous rumor.

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The Yarn Market.

Sharp declines in price have featured the Boston cotton yarn market for the past month and yarns are now available in practically all numbers at the lowest rate for many months. Southern yarns have been especially soft and in the lower counts are less expensive than a year ago at this time. The higher counts, which dropped further in actual cents than the low counts, are still more costly than they were a year ago, however. Northern yarns are more firm, although they are no exceptions to the rule as far as lower prices are concerned.

In fact, prices are so low as to actually tend against purchase and it is a matter of record that buyers have, upon learning the quotation, backed out when the sale was practically assured. Then, too, the unsettled conditions have brought about a wide range of prices, replacing a stable market quotation, owing to the financial situation affecting individuals. This has tended towards further unsettled ideas on part of possible purchasers, and at this writing prices are no attraction whatever. Some spinners, resenting the low prices, prefer curtailment: others are out after new business and express a desire to figure closely in order to get it. Not a few of them are waiting for a more settled outlook, both for raw cotton and in the yarn and manufactured goods trades, before attempting to readjust their quotations. A tendency is noted to forego profits temporarily if, by such action, confidence can be restored. But spinners generally are in sad need of new business and curtailment has been the only alternative for large numbers of them.

"Vacation" periods were in order and heartily welcomed by most manufacturers this season, and Labor Day saw practically every textile mill shut down for a week or two. The reopenings were on curtailed operating schedules and in New Bedford alone about 20,000 cotton mill operatives are idle, either wholly or partially. Present production in all New England textile centers is estimated from 50 to 75 per cent of normal.

Many of the trade reported a revival of interest in cotton yarns, to a limited extent, about four weeks ago. The tone of the market was better and indications pointed to the long looked for ending of trade depression. Hardly had this feeling gained ground, however, before the decline in raw cotton forestalled further improvement and the better feeling gave way to renewed dullness. And now the spinners feel that buyers will enter the market with a rush of orders when business does pick up and warn that such action will cause a quick reaction of prices where some will want the yarn badly enough to offer higher value to expedite its delivery. The natural law of supply and demand will undoubtedly aid materially in firm prices at that time, they say. Meantime the belief is gaining ground that the bottom has been reached, and that owing to the long drawn out period of dullness, business will revive to some extent in the near future.

Over-production in the tire market has been reflected in continued dullness of tire yarns, prices for which are lowered still further. Incidentally the general downward trend of all basic commodities is reflected in tire manufacturing, where crude rubber is now selling around 30 cents, compared with 55 and 60 cents prior to the war and $3.00 about 10 years ago.

Thread yarns have not felt the shock of the decline so severely as have yarns for hosiery and underwear. Consequently they are now expected to come in for a share of price slashing before the influx of the new crop of long staple cotton.

Simultaneous with the excessive quietness in the market, comes the report of raw cotton receipts at the five chief New England textile centers for the season of 1919-1920, which totaled more than 230,000 bales in excess of the previous season's receipts. Few look for this record to be equaled this season however. The cities referred to are New Bedford, Fall River, Lowell, Lawrence and Manchester. The season ended August 1. Total receipts for the season were 1,347,404 bales, compared with 1,119,023 for the previous season and 1,409,063 bales for the season of 1917-1918, the latter being the banner year for raw cotton consumption when the mills were working generally on war work. New Bedford received practically a third of the entire total, its share being 546,964 bales, Fall River receiving 395,577 bales, Lowell 216,433, Lawrence 66,322, and Manchester 122,108.

Recent Boston quotations follow:

Southern Single Carded Cones.			
10s	52	12s	53
14s	54	16s	56
18s	58	20s	59
22s	60	24s	61
30s	75	40s	95@$1.00
Weaving Yarns—Warp Twist.			
10-2	54	12-2	55
14-2	56	16-2	58
20-2	60	24-2	65@ 68
30-2	74@ 78	36-2	95@$1.00
Northern Carded.			
10-1	58	16-1	60
20-1	64	26-1	68
30-1	72	40-1	$1.05@$1.10
Northern Combed.			
10-1	90@ 95	16-1	$1.03
18-1	$1.05	20-1	$1.14
26-1	$1.17	30-1	$1.15&$1.20
36-1	$1.25	40-1	$1.30

Conditions in the Philadelphia cotton yarn market during the past month were practically a repetition of those prevailing during the previous four weeks or so. Price recessions were continued throughout the period, with the same restricted buying which has featured this market for some time. The price reductions, which were as a whole scattered throughout the list, were such as to make for quotations of a very irregular character.

Prices quoted during the first week of the month just ended were more irregular than in any similar period of time since cotton yarns first came under the present deflating influence. For example, 20s single and ply in southern carded warps merely eased off during the week referred to, whereas counts above 20s of the same variety showed more numerous signs of panic conditions than in and previous week, dropping in some instances as much as 15 cents a pound within a few days. As a whole, ply yarns received relatively greater recessions than did single yarns. Prices continued their downward journey with comparative celerity and there was no appreciable demand to speak of.

The next week's trading was very similar to that of its predecessor in the character of demand and inquiry and the trend of prices. Notwithstanding this, the market gave evidence of improvement in tone during the week. There were few tangible circumstances to account for this. Prices were cut to get the little business offered; in this week 40s southern carded yarns, for instance, dropped to between 90 and 95 cents. This optimism was as much a matter of psychology as anything else.

The third week brought trading of a character which gave little comfort to either spinners or local dealers. Prices continued to soften, without demand being noticeably increased thereby. It appeared at this time that the optimistic conditions of the previous week were somewhat misleading. Combed yarns led the field on the continued downward trip, one reason being given for this was that the spinners of these yarns had been more stubborn as to concessions. Northern combed peeler cone yarns demonstrate the soundness of this statement. Published price lists had them down, during this period, to a basis of 85 cents for 10s, 90 cents for 20s, $1.00 for 30s and $1.10 for 40s.

A concurrent factor in assisting with the price reduction was the fact that offerings were made in this market of yarns intended for export, which had been thrown back because of cancellations elsewhere. The extent of this rejected stock was not given out, nor were the varieties and grades of yarn involved learned.

Reports in the fourth week, during which this is being written, indicated a still greater easing off in the list price of a good many counts. There was no increase in demand and inquiry showed little improvement.

Considerable is being heard at this writing about inquiry for export received by those interested in South American trade. Such inquiry is cited as showing that demand for export is not entirely at a standstill. However, this inquiry seems to be based upon price ideas which are absurd in the light of current conditions.

Recent Philadelphia quotations are appended:

Southern Single Skeins.			
4s to 8s	48	10s	49
12s	50	14s	51
16s	53	20s	56
24s	58	26s	60
30s	62		
Southern Single Warps.			
8s	49	10s	50
12s	51	14s	52
16s	53	20s	56
26s	62	30s	64
40s	90		
Carpet and Upholstery Yarns in Skeins.			
8-3-4 slack			44
9-1-4 slack			44
8-3-4 tinged tubes			37
8-3-4 hard white warp twist			44
8-3-4 hard twist waste			37
Southern Two-Ply Skeins.			
8s	50	10s	50
12s	51	14s	53
16s	54	20s	55
24s	59	26s	59½
30s	60	40s	90
Southern Two-Ply Warps.			
8s	51	10s	52
12s	53	14s	54
16s	55	20s	56
24s	59	26s	60
30s	63	40s	30
Southern Two-Ply Combed Peeler Skeins and Warps.			
20s	85	24s	90 @95
30s	$1.00	40s	$1.05
50s	$1.30	60s	$1.45
70s	$1.60	80s	$1.75
Southern Frame Spun Carded Yarn on Cones.			
8s	48	10s	48
12s	49	14s	50
16s	51	18s	53
20s	54½	22s	55½
24s	60	26s	61
30s	62	40s	90 @95
30s tying-in			60
30s double carded			65@68
Northern Mule Spun Carded Yarn on Cones.			
10s	58	12s	59
14s	60	16s	61
18s	62	20s	63
24s	66	26s	67
30s	79	40s	$1.00
Northern Mule Spun Combed Peeler Yarn on Cones.			
10s	85	12s	86
14s	87	16s	88
18s	90	20s	92
22s	95	26s	97
28s	98	30s	$1.02
36s	$1.05	38s	$1.07
40s	$1.10		

The Knit Goods Market

Reports from manufacturers and jobbers show that probably more hosiery changed hands in the primary market in September than in August, but the transactions were largely in distress merchandise, so that among mills there was really no improvement in business. On the other hand, more mills were idle at the end of September than on the first of the month. A mill prominent among those making misses' ribbed goods sold four days production in August and shipped out the equivalent of 20 days output. At that time the mill was in operation. By mid-September it was idle and had not resumed operations at the end of the month. This, it is believed, describes approximately conditions in the average mill. Factories operating full time are making specialties or branded lines and those selling the retail trade direct. Mills in this class, although a number have been idle, have had less to complain of than those selling to jobbers.

Cotton hosiery of the cheaper types were the last to feel the full force of the effect of deflation, 176 needle half hose of standard types being offered by some mills at as low as $1.40, while distress goods of the same gauge have been available at even less, buyers being able to obtain merchandise at less than the cost of the yarn alone, while full fashioned silk hosiery for women have sold under the cost of labor, to say nothing of the silk and mercerized yarn for the top and foot.

This is bringing prices down to a stage where common sense dictates one of two alternatives must be the result —there either will be absolute collapse, with more failures than were chronicled in all of the industrial and financial panics since 1893 combined, or a return to prices that will show a profit for the producer. At the moment any forecast of the near future is likely to be the product of a wish rather than based on knowledge of what is in store.

There were unexpected happenings in hosiery about the middle of September, when full fashioned silks, which jobbers bought in January-February at $32.50 a dozen, were priced by the mill for fall, $13.50, while other mills had opened at about a dollar higher. One of the large full fashioned silk hosiery mills announced a rebate of $17.50 to jobbers who had its line on order at $30. On unfilled orders placed at $22 the rebate is $9.50. Full-fashioned silk half hose was put on the market at $8.50. A drop from $15. Seamless silks were priced $6.50, against pre-war $3.50. Thus silk hosiery for the time has established an approximately twice pre-war value. The recessions in hosiery may be attributed in some measure to what happened in piece goods a week before. The American Woolen Company and the Pacific Mills opened their lines on Thursday, followed on the next Monday by the Amoskeag. Some business was being booked by the two concerns first mentioned, but a day after the Amoskeag got into the market both were kept busier, it is related, in resisting cancellations and revising price lists than they had been during the opening days in writing orders. The Amoskeag got well under their figures.

A repetition of this policy for starting something seems not unlikely, for an executive of an underwear mill says:

"We may not name spring prices before November 1—certainly not prior to the middle of October, and I am free to say that if any of our competitors open before October 1 the probability is our prices, when we name them, will be under theirs. I am in accord with the view that this is no time to name prices for spring. We do not guarantee prices; neither do we accept cancellations. Therefore we shall so shape our selling campaign as to assure our customers, so far as may be possible, that the prices we name will be the lowest for the season."

The light weight underwear opening, by a vote of 27 manufacturers in favor, to 25 against, was scheduled for September 20. Not a buyer appeared on that date or the day following, and not a mill named prices. So the opening was indefinitely postponed.

Absence of jobbers may be attributed to their asserted determination to pay not more than twice pre-war prices. The figures decided upon by manufacturers were about three for one. For illustration, balbriggan shirts and drawers, the indicated price was $5.25. Before the war the garment went to jobbers at $1.75 to $1.87½ and retailed at 25 cents. In one retail store recently it was being sold at 45 cents, which on the per dozen basis is only 15 cents more than mills are asking jobbers to pay.

Heavy weight underwear values have been badly shattered. Jobbers are understood to have bought 16-pound cotton ribbed union suits at five to six dollars under the price of several months ago and one jobber offered to another a line of 11-pound shirts and drawers at $7.50, a drop from $13.50. The present mill price is $11. The jobber to whom the garments were offered declined to take, at almost one-half the top price.

There is much speculation as to the quantities of knitted goods in dealers' hands. Recently the representative of a group of mills wrote a very large buyer, suggesting that he come to market and avail himself of some of the very low offerings. The buyer replied:

"You could not make them (a standard line of cotton stockings) cheap enough to sell me any. If you do sell any, increase your quantities a few thousand dozens and help us dispose of some of ours. We will not be in the market for any of your class of goods for some time. I do not say this to get you to quote lower prices, for you could not interest me at any price."

All the leading jobbers, it will be recalled—notably those issuing monthly trade circulars—boasted of record business in July and almost as much in August. These have not been buying. Of three well known jobbers who permitted a visitor to look through their warehouses, not one carried a normal stock, and one admitted that if he sold one-half as much in September as in either July or August his bins would be empty before October.

A number of jobbers maintaining an organization—not national, by the way—insist they were factors in the downward revision. A member of the organization is quoted as saying there was an agreement among members to buy nothing until December. When this was brought to the attention of another member, he said, "There was no agreement; only an understanding. You see," he continued, "we couldn't tell what might happen the next day; so we bought from each other as long as we could. Now

the mills have got the better of us, and some of us are going to lose more money, in meeting the mills' new prices."

None of the members of the organization, a jobber says, has anything like a normal stock. Some of them would obtain a price from some other jobber and then go out and offer goods. In this way, he said, it was found possible to carry on a wholesale business on a retail basis, without the investment of much capital.

There is nothing in the the primary market to indicate a prospective scarcity of hosiery, notwithstanding assortments are badly broken and some of the wanted shades and colors may not be immediately obtainable. Yet there is no likelihood that anyone in the next few months will go barefoot for want of stockings, even though curtailment be carried still nearer complete stoppage.

In the descending market jobbers have not been tempted to buy, except for immediate wants, and these often were filled through second hands. There was more buying of this character in September than in August, however, which is taken to mean that stocks are being reduced and must be down to almost bare shelves. One reason for believing that jobbers are fairly well supplied, as a broad proposition, is the fact that they are parting with merchandise at severe sacrifice. For example, a department store bought several weeks ago 100 dozens of women's mock fashioned silk hosiery at eight dollars, but at the time had delivered only 50 dozens. More recently, when called on to take in the remainder of the goods, the buyer demurred, stating he could not pay more than $6.75; that such a price had been named for the identical line. He got the stockings at the lower price, which showed a considerable loss for the jobber.

This same jobber has in his warehouse very large quantities of cotton hosiery, some taken in recently, and which is being offered at five cents a dozen less than the price paid to the mill. This jobber is not forced by financial conditions to liquidate at any such sacrifice. That he is doing so means he either is looking for lower prices or fears buying by the trade in general is not to be resumed for some time.

Full mercerized half hose have been offered by a manufacturer to a jobber at two dollars a dozen, barely covering the initial yarn cost. This figure is the more significant when it is recalled that in the last week in August a manufacturer in New Jersey created something of a sensation by offering a similar sock at $3.25. A dozen of these socks will consume approximately one pound of yarn. The lowest price yet heard for mercerized combed peeler 2-ply is $1.50, and it is fair to assume that hosiery made from yarn at this price has not yet been offered.

Another reason for the belief that the market is abundantly supplied with hosiery is the fact that, while jobbers have been buying comparatively none in the last three months and retailers have been selling about normally, there has been taken out of the domestic market this year fully 11,000,000 dozen pairs of cotton and artificial silk. It is not extravagant to say that since July, when mills began closing down, 3,000,000 dozens production has been lost.

Exports of hosiery in July totaled 820,932 dozens of cotton, valued at $3,012,409 and 56,171 dozens of artificial silk, of a value of $495,514. Cuba was a very large buyer, receiving 122,040 dozens of cotton and 3511 dozens of artificial silk. The only heavier purchaser was England, 168,460 dozens of cotton and 17,962 dozens of artificial silk. Other countries taking more than 10,000 dozens of cotton hosiery were: Denmark, 12,630; France, 74,352; Italy, 13,637; Canada, 30,789; Mexico, 13,058; Argentina, 39,467; Chile, 34,491; Columbia, 13,987; Peru, 19,454; Uruguay, 17,204; British India, 22,385; British South Africa, 15,108; Australia, 97,105; Philippine Islands, 16,670.

Countries taking more than 1000 dozens of artificial silk hosiery were: Denmark, 1200; France, 1710; Italy, 2351; Spain, 1196; Canada, 2188; Argentina, 10,185; British India, 2580; British South Africa, 1892; Turkey in Asia, 3747.

Argentina was the second heavier taker of artificial silks, being led by only England. The exports of artificial silks were the lowest for any month since 1918 with the exception of December, 1919. The total for the seven months of 1920 to July 31 is 522,551 dozens, against 1,593,865 for 1920. Cotton hosiery exports for the seven months were 8,100,442 dozens, which is only 1,376,932 dozens for the whole of 1920.

While with exports there have been taken out of domestic normal supply 11,000,000 dozens in seven months of this year, prices of hosiery have not been high because of scarcity, but rather for the reason that a great part of the public is paying extravagantly, although, perhaps buying conservatively. If curtailment amounted to but one pair of stockings per year for every man, woman and child resident in the United States it would amount to approximately 9,000,000 dozen pairs, or 30,000 dozens a day.

But we should not think of overproduction, said a manufacturer at the meeting in Charlotte some days ago; "it were better that we improve in what we make, in order to increase demand, and that we find new markets." This manufacturer looked for a vast improvement in the spinning of cotton yarns. Competition, he thought, would make for better spinning and higher grades, notably of fine count yarn, so that part of the battle of the knitting manufacturer in striving for better merchandise will have been won by the time he gets his yarn.

On the other hand, it will be a costly deception if manufacturers try to fool themselves and succeed in doing so. It has been found a rather difficult matter to fool the jobber and it will be no easier henceforth. It behooves every manufacturer to face the naked truth and shape affairs accordingly, manufacturing what can reasonably be expected to be absorbed and no more. Doubtless there will be a market for all of the best American hosiery that will be produced, but it were not wise to anticipate such a market in face of the warning of the Federal Reserve Board that the declines are not comparable to what will happen in the coming months. For the present, stoppage would be perhaps wiser than curtailment.

It has been shown by mills reporting to a federal reserve bank that in July production fell off 36 per cent in comparison with June, and 17½ per cent as compared with July, 1919. The August and September falling off was greater than that for July, and still there has been no lack of hosiery for meeting the immediate need of jobbers.

Underwear production in July dropped 17 per cent from June and 13 per cent from July, 1919. Here again curtailment has increased since July, and by September more than 50 per cent of the light weight underwear machinery being operated in January last was idle. A discouraging phase of the underwear situation from the standpoint of the manufacturer is that at the end of July there was on hand 40 per cent more finished product than at the end of June, while there was a decrease of 23 per cent in unfilled orders and 60 per cent in orders booked. Hosiery manufacturers selling to jobbers had 137 per cent more finished product at the end of July, 1920, than at the end of July, 1919, and unfilled orders had fallen off 32 per cent, these figures applying to the mills reporting to the federal reserve bank, but regarded as reflecting the situation generally.

A women's stocking of silk and fiber which sold at $16.50 during the peak of the boom was offered recently to jobbers at $8.25 and did not prove attractive. The identical stocking subsequently, in second hands, was bought at $6.50. Now it is priced $7.50 by a mill. A mill selling through a commission merchant named $9.50 for a 19 inch boot 12 thread silk, 240 needle, with fashioned ankle, and $8 for 220 needle 18 inch boot. The commission house quotes $7.75 for artificial silk, 19 inch boot. It will be observed that the difference between the better all tram silk stocking and that of all artificial silk is only $1.75 a dozen, the latter being offered at about the ruling price of women's mock fashioned mercerized in February. Yet the declines in silk and mercerized are not more sharp than were the advances when the market was steadily advancing.

The most encouraging feature of the hosiery market situation is the scarcity in several lines, in which, strange to say, manufacturers have been reluctant to name prices for spring. For example, one of the very large manufacturers of infants' socks is in the market, seeking to buy from some mill having no direct selling agency. Then, too, a mill selling the retail trade is producing 10 per cent more than a year ago, operating to capacity, and since naming advances several months ago has sold more than a million dollars worth of hosiery, about 10 per cent of the orders having been cancelled, however. The mill guarantees its prices against its own declines.

This may prove a costly proposition, unless prices be named sufficiently high at the start to provide for contingencies, such as unlooked for competition from sources where raw material purchases were deferred until after the sharp decline in silk, wool, and cotton. The question whether the guaranteeing of prices is not an unfair trade practice is to be ruled on shortly by the Federal Trade Commission, some of the members of which are known to be antagonistic to the guarantee.

Knitting manufacturers are to be asked to attend a hearing at the Federal Trade Commission building in Washington, presumably in the latter part of October, when the matter of alleged misbranding will be gone into. The Commission as at present advised inclines to the belief that the public is being misled by such terms as "Merino," "Cashmere," and certain combinations of words testimony of manufacturers on the question whether the company.

commission is correct in its conjecture. The commission questions also whether the use of weighted silk in the manufacture of hosiery is not wrong, unless goods so made be marked to show the fact.

Many manufacturers already have given to the Commission an opinion on the fairness or unfairness of guaranteeing prices. The majority of those in favor are manufacturers of agricultural implements and jobbers of merchandise generally. Only one cotton manufacturer favored the guarantee, and the only two hosiery manufacturers who were heard from were opposed, as is a great majority of knitting mill heads.

The guarantee is held to be unfair for one reason, that the buyer has all to gain and nothing to lose, giving no guarantee to protest the seller in a rising market. Furthermore, it is held, the guarantee encourages overbuying, certain to prove disastrous eventually, as has been instanced in the last year, during which the guarantee was not extended by mills, until quite recently, and then mainly by those selling to retailers direct. It is expected the Commission late this year will make a ruling on the subject, and also dispose of the contention over the use of certain terms used in branding merchandise.

One dealer advertises 'Tyrol Wool." The term is catchy, and the average buyer, it is held, is influenced more by the combination of words than by knowledge of the actual content of the fabric. A New England manufacturer recently was ordered by the Commission to cease using the words "Merino," "Cashmere" and "Super Cashmere." Having been so ordered, it is believed this manufacturer has complained against competitors using similar terms and against whom no cease and desist order has gone forth.

B. H. Bunn & Co., 9970 Charles Street, Chicago, manufacturers of mail and package-tying machines, are producing a machine whose use in tying bundles or boxes of hosiery or other uniform bundles is proving a great time and labor saver. It ties a package accurately at a high speed, it is said, wrapping the string around tightly. This machine also makes for increased economy. It uses only just enough string to accomplish the purpose, making a fast, compact knot each time thus decreasing the likelihood of the bundles or boxes tied becoming untied; a patent knotting mechanism, insuring a non-slip knot, is used.

The speed of this machine is limited only by the ability of the operator to handle the bundles or packages being tied. One complete operation can be carried out in two seconds, making it possible for one girl using this machine to do the work of three to five girls using the hand tying method. This machine is made in several sizes and in different models. The manufacturers state that they shall be glad to furnish any information regarding the different types of their machines upon request.

"A Study of Various Types of Belting," a 20-page, illustrated booklet, is being mailed out by Edw. R. Ladew Co., Inc., Glen Cove, N. Y. This is an interesting, unbiased treatise on the transmission of power by various types of belting under various conditions. Those readers desiring copies can no doubt secure them upon request to the Ladew used for branding hosiery and underwear, and wants the

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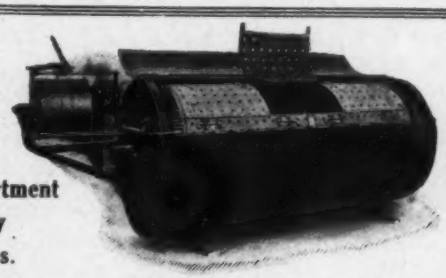

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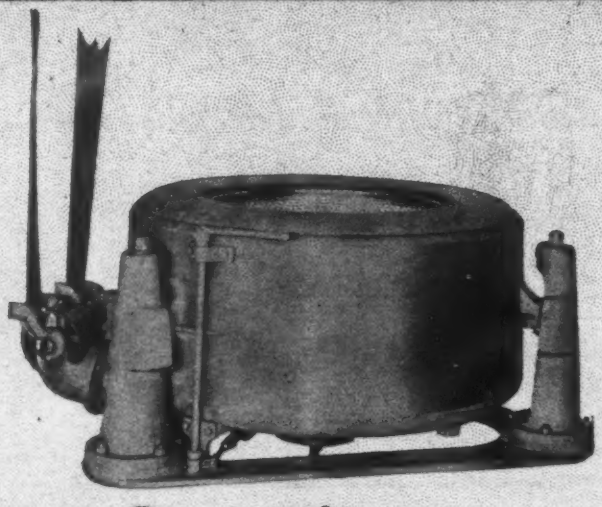

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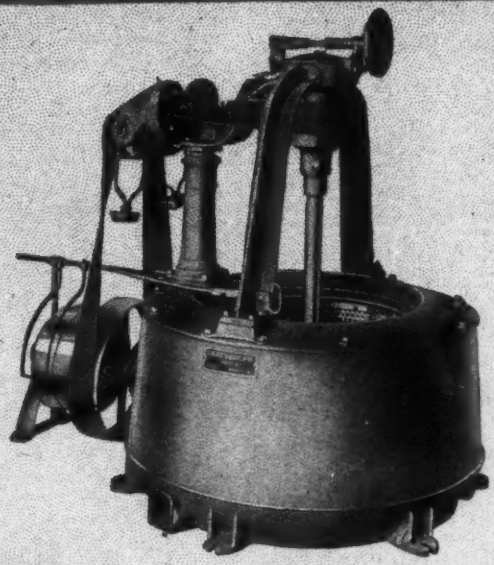

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Main & McNab Streets, Hamilton, Ont. 400 McGill Bldg., Montreal

CTORS

Can *Your* Goods Pass the Eye Test?

Many a manufacturer of hosiery is asking himself the question today—for it's been demonstrated that when competition's keen, and quality is on a par, it's *looks* that sell the goods.

The eye test—the close scrutiny by the customer—there's the severest examination your product must pass when it's set before the buyer.

And that's why manufacturers are installing American Rotary Hosiery Presses. Hosiery finished on this equipment comes out pleasing to the eye—that kind of product that commands and holds the customer's attention.

Then there's this other important feature about the American Rotary Hosiery Press—it's flexible. It matters not whether you make a single grade, or many grades of hosiery, you can finish them all on the one machine.

This equipment is adjustable in such a way that you can give your goods any sort of finish you may desire—and once set, you are assured speedy, *uniform* and steady production.

Have us show you how an American Rotary Hosiery Press can assist you in the way of promoting sales, and cutting labor costs. Put it up to us—write, and at no cost to yourself we will place before you exactly the facts you'd like to have.

With the American Rotary Hosiery Press 4 girls can do the work of 10 strong men.

The American Laundry Machinery Co.

Specialty Department C, Cincinnati, Ohio

ALSO MANUFACTURERS OF AMERICAN MILL VILLAGE LAUNDRIES — AUTOMATIC UNDERWEAR PRESSES — UNDERWEAR FINISHING PRESSES — KNIT FABRIC CALENDERS — ROTARY FULLING AND DYEING MACHINES

"Foxwell" Pneumatic Guider and Feeder

Not an accessory device—the "Foxwell" Pneumatic Guider and Feeder is a complete machine in itself. Built to do a certain job—and do it better than ever, at much less cost.

It feeds fabric of any weight with undeviating accuracy—taking the place of human hands and cutting waste and wages.

Send for the "Foxwell" book.

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA

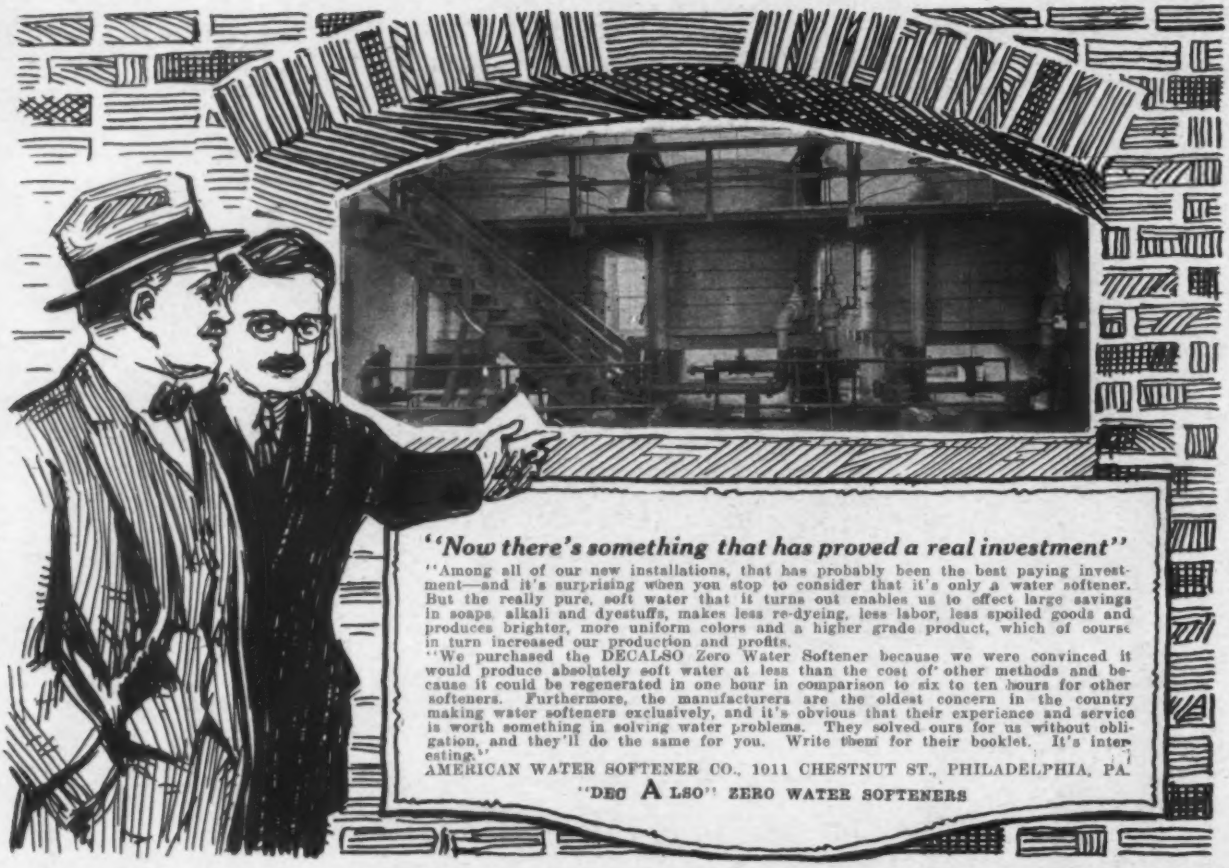
PROVIDENCE OFFICE
Turk's Head Building

Canadian Representative
W. J. WESTAWAY COMPANY
Hamilton, Ontario. Canada

Bleaching Machines
Drying Machines
Singeing Machines
Mercerizing Ranges
Hydraulic Presses
Dyeing Machines

FINISHING
Butterworth
MACHINERY

Soaping Machines
Tentering Machines
Mangles (all kinds)
Calenders (all kinds)
Color Kettles
Cell Dryers



"Now there's something that has proved a real investment"

"Among all of our new installations, that has probably been the best paying investment—and it's surprising when you stop to consider that it's only a water softener. But the really pure, soft water that it turns out enables us to effect large savings in soaps, alkali and dyestuffs, makes less re-dyeing, less labor, less spoiled goods and produces brighter, more uniform colors and a higher grade product, which of course in turn increased our production and profits.

"We purchased the DECALSO Zero Water Softener because we were convinced it would produce absolutely soft water at less than the cost of other methods and because it could be regenerated in one hour in comparison to six to ten hours for other softeners. Furthermore, the manufacturers are the oldest concern in the country making water softeners exclusively, and it's obvious that their experience and service is worth something in solving water problems. They solved ours for us without obligation, and they'll do the same for you. Write them for their booklet. It's interesting."

AMERICAN WATER SOFTENER CO., 1011 CHESTNUT ST., PHILADELPHIA, PA.

"DECALSO" ZERO WATER SOFTENERS

COCKER HOSIERY DYEING MACHINE

THIS machine has been thoroughly tested out with all colors and under all conditions, and is guaranteed to give the very best results possible in the dyeing of hosiery.

The stock is carried in four perforated metal containers equipped with one removable head on each container, and the containers mounted on Spiders in such a manner as to permit of their being loaded and unloaded quickly from the machine.

The Spiders carrying these containers are revolved in the vat *in one direction.*

Machines are furnished with either belt or motor drive.

Points of Advantage in This Machine That Must Be Considered

1st—Matting and chafing of the stock is entirely eliminated.

2nd—Percentage of re-dyes is reduced to a minimum.

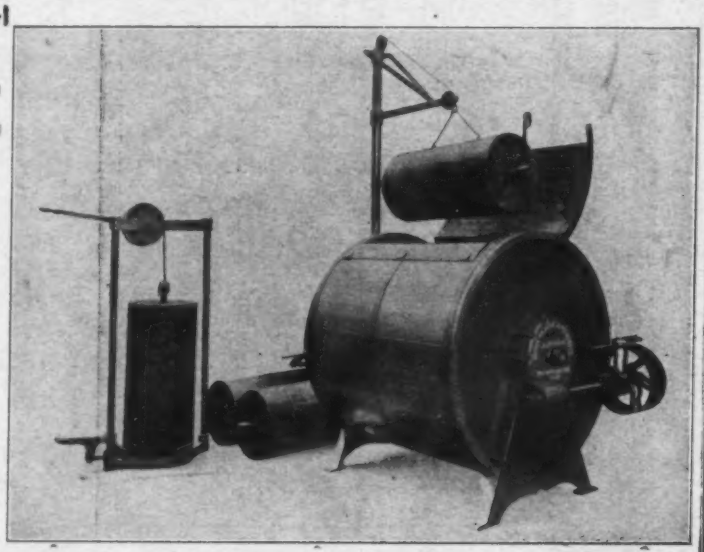
3rd—Different sizes and descriptions can be handled in one dyeing without confusion.

4th—Time required for loading and unloading machine reduced to a minimum.

5th—Absolutely level dyeings on all colors.

6th—Minimum of power required for operation.

For further particulars and prices write or wire.

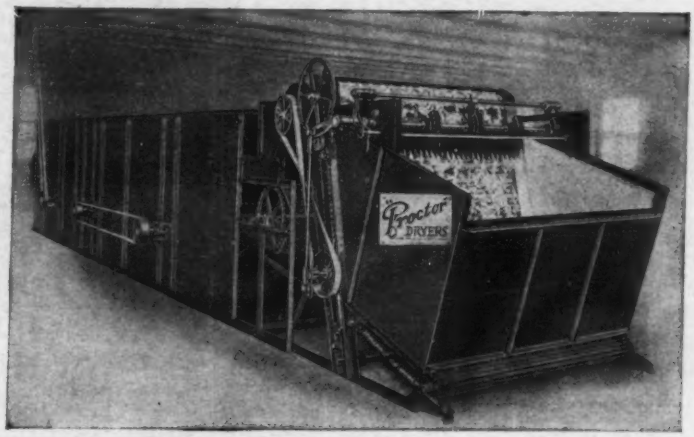


Cocker Machine & Foundry Co.

GASTONIA, N. C.

Builders of Textile Machinery.

Warpers—Beamers—Baling Attachments—Warp Dyeing Machinery—Reels



PROCTOR RAW STOCK DRYER (SINGLE CONVEYOR TYPE) FOR COTTON, FUR, HAIR, RAGS, WASTE, WOOL, ETC.

Is Your Drying Operation Profitable?

Have you ever considered whether your present drying system is as economical as it should be? How much time, labor, steam, and floor-space are involved in your present output? How much uncertainty due to variable weather conditions?

Proctor Dryers embody so many superior characteristics that it may be profitable to discard your old system and install a Proctor. We shall be glad to investigate the matter for you.

Send a batch of your wet material to our Engineering Department. They will dry it under industrial conditions and submit a report showing what the Proctor Dryer is guaranteed to do in your own plant. This service involves no cost or obligation.

PROCTOR AND SCHWARTZ, INC.
Formerly Phila. Textile Mach. Co.
60 Tabor Road PHILADELPHIA, PA.

"Proctor" DRYERS

117

Soft Water Did It.

These two samples match perfectly, yet they were taken from pieces that were dyed in separate runs more than three weeks apart, and without redyeing.

Both runs were made up with the same formula on the same cloth. The reason they came through a perfect match is because the water used was soft, zerowater furnished by a Permutit Water Softening and Filtering System, and therefore, absolutely uniform in quality.

Permutit Softeners are the only dependable producers of uniform water of such character. They will produce quality and savings in manufacturing, and reduction in supplies that cannot be overlooked nowadays.

We will make an investigation and an analysis of your problem without cost or obligation to you—write us today.

The Permutit Company
440 Fourth Ave. New York
Offices in all principal cities

92

TEST COLOR FASTNESS BY RADIATION METHOD

The need for a basic standard brought the perfecting of this method of determining fastness to light of colors and dyestuffs.

The FADE-OMETER was designed solely to fill a need for a standardized light equal in intensity to sunlight and available at any period of the year.

Elimination of the old time sun testing method has brought about a revolution of vast import to the textile manufacturer who using the Fade-ometer standard, reproducible tests can now be made in a few hours.

Unequaled for comparative service. Write us for fuller information in regard to this instrument.

ATLAS ELECTRIC COMPANY
360 W. Superior Street
CHICAGO, ILLINOIS

IMITATIONS

We are not surprised to learn that Sulphur Blacks made to imitate ATLANTIC BLACKS, are now being offered.

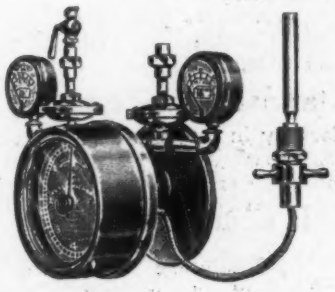
This is only a natural result following the acceptance of ATLANTIC BLACKS as the standard of Sulphur Blacks by both Producer and Consumer.

"Imitation is the sincerest form of flattery."

No reason exists for a buyer to accept an imitation when he can get the genuine article —as he can in the case of ATLANTIC BLACKS.

Atlantic Dyestuff Company
WORKS: PORTSMOUTH and BURRAGE
MAIN OFFICE, BOSTON
NEW YORK PHILADELPHIA CHARLOTTE
CHICAGO PROVIDENCE

WHAT HAPPENS?



What happens if you pour cold size mixture in the hot mixture? The temperature drops, of course.

Then, if you open a hand valve you may shoot it too high; you may not get it high enough. Anyway, it takes time and a skillful operator on the job.

The TAG Perfect Temperature Controller does it right and saves labor. The second the temperature drops, the steam inlet opens; the second the temperature returns to the right point, the valve closes. It's all automatic.

Rapid changes of temperature do not impair the operation of the TAG Perfect; it's made right; it's made by TAG.

Bulletin C-425 explains.

C. J. TAGLIABUE MFG. CO.

Temperature Engineers Since 1769

C.J. TAGLIABUE MFG. CO.
TEMPERATURE ENGINEERS
18-88 Thirty-Third St. Brooklyn, N.Y.

An Invitation

to

Textile Mill Executives

The Borromite Co.
of America
will demonstrate the

Borromite System of Water Softening

at

Booth 54, Southern Textile Exposition
October 18th to 23rd 1920

This is the Zeolite System which for the past six years has consistently met all requirements under all conditions in various industries from the Alleghenies to the Pacific Coast.

It is the System you have heard about —especially its quality of quick reconditioning, (30 minutes to one hour); its reliability as to producing ***uniformly zero water;*** *long life of mineral; 100% efficiency; mechanical simplicity; etc.*

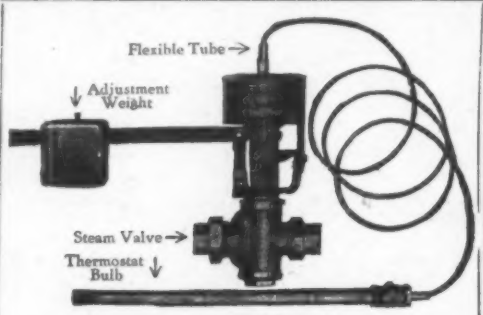
This is our first demonstration in the Eastern States.

You are cordially invited to call at Booth 54 and see model in operation.

J. S. HULME, of Atlanta, Ga., will be in charge of exhibit.

Members of Associated Mfr's. of Water Purifying Equipment.

The Borromite Company of America
General Offices,
105 W. Monroe Street, Chicago



The Powers Regulator No. 11
Entirely self-contained, requiring no air or water pressure for operation. Automatic, reliable, and accurate.
Peculiarly adapted to the control of liquid temperatures in dye kettles, size boxes, slashers, etc.
Other Powers Regulators for other uses.
Write for Bulletin No. 129.

Standardize-Economize

A Powers Automatic Heat Regulator saves labor, by mechanically controlling temperatures as required, thus relieving the men for work which machines can't do.

It also positively prevents the ruin of **material** through **overheating** and **underheating.**

The Powers Regulator never forgets—never procrastinates—never shirks. It controls the heat—keeps it where you want it—**all the time.**

It Standardizes Results

"Powers" uniformity in temperature insures uniformity in output. You can always be sure of right results—no frail mortal's memory or judgment need be trusted.

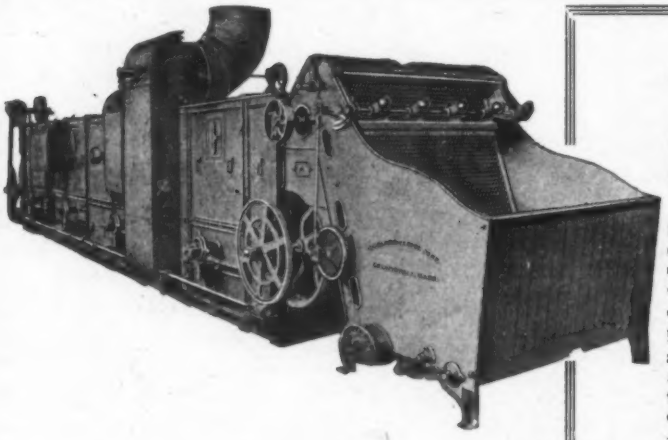
It Economizes

In the size box a "Powers" saves sizing and prevents chafing. In the dye bath, it prevents variations in color. In the stentering room it prevents burning and tearing. Its efficiency is seen as soon as it is put into operation.

During our more than thirty years of experience in heat regulation we have gathered facts that are vital to the textile industry. Our knowledge is cheerfully at your service.

(1182)

THE POWERS REGULATOR CO.
Specialists in Automatic Heat Control
985 Architects Bldg., New York 2761 Greenview Ave., Chicago
396 The Federal St. Bldg., Boston
The Canadian Powers Regulator Co., Ltd., Toronto, Ont.



The Last Word in Dryer Efficiency

Sargent Dryers mark progress in Dryer Development comparable to that made in other fields of mechanical endeavor. They contain the latest and most up-to-date improvements.

They are favored with a natural preference because they are designed on basic principles of air circulation, conveying, and general drying apparatus construction, which have had the approval of discriminating mill men and drying engineers for many years.

In the Sargent Dryer these principles have been combined and refined, making a complete machine which is unexcelled.

For drying cotton, linters, wool, hair, flax and other classes of raw material.

C. G. SARGENT'S SONS CORPORATION
GRANITEVILLE, MASS.

Fred H. White, Southern Agent, Charlotte, N. C.

SARGENT DRYERS

Largest Manufacturers in United States of

Basic Colors

As is well known, Basic Colors represent a group of dyestuffs indispensable to a number of industries, such as:

Cotton Manufacturing
Printing of Cotton Goods
Paper Manufacturing
Leather Manufacturing
Carbon Paper Manufacturing
Typewriter Ribbon Manufacturing
Printing Ink Manufacturing
Lake Manufacturing
Silk Dyeing
Cotton Printing

The types included in their manufacture represent such a variety as:

Du Pont Crystal Violet Powder
Du Pont Crystal Violet Base
Du Pont Methyl Violet NE
Du Pont Methylene Blue ZX (Zinc Salt)
Du Pont Methylene Blue B (Zinc Free)
Du Pont Victoria Blue BX and Conc.
Du Pont Victoria Blue B Base
Du Pont Victoria Green Small Crystals
Du Pont Victoria Green B Powder
Du Pont Auramine O and Conc.
Du Pant Chrysodine G (Yellowish)
Du Pont Chrysoidine R (Reddish)
Du Pont Rhodamine B and B Extra
Du Pont Basic Brown BXN (Reddish)
Du Pont Basic Brown GX (Yellowish)
Du Pont Nigeria Black BX and GX

and the closely related:

Du Pont Phloxine B
Du Pont Rose Bengal
Du Pont Erythrosine B

The completeness of this group of dyestuffs will easily be recognized as of utmost importance to many industries. The purity of shade and strength represent the best that can be produced. The standardization is given the most careful attention.

Do not fail to see our unique display at Sixth National Exposition of Chemical Industries, Grand Central Palace, New York, week of September 20th. You are cordially invited to make our booths, 7 and 8, your headquarters.

E. I. DU PONT DE NEMOURS & COMPANY, Inc.

Dyestuffs Sales Department

WILMINGTON, DELAWARE

Branch Offices:

New York Boston Providence Philadelphia
Chicago Charlotte, N. C.

DU PONT DYESTUFFS

ALTHOUSE CHEMICAL COMPANY

OFFICE AND WORKS

READING, PA.

MANUFACTURERS OF

Direct Colors

Brilliant and Level Dyeing Qualities

Prompt Delivery

ALTHOUSE CHEMICAL COMPANY

Nopcocaster—an Efficient and Economical Oil

National Oil Products Company
General Sales Office
220 Broadway
New York

NOPCO PRODUCTS

October 1920.

NOPCOCASTOR is a Turkey Red Oil greatly superior to ordinary oils, because it:

1 Effects better penetration of the dye.
2 Increases affinity of dye and fibre.
3 Produces perfectly level shades.
4 Increases fastness of colors.
5 Renders colors full and brilliant.
6 Prevents streaks and stains.
7 Effects uniform mixed color absorption.
8 Produces highest degree of softness.
9 Increases lustre, decreases shrinkage.
10 Prevents frothing in finishing and printing pastes.

Every drop of NOPCOCASTOR will give these good results because the oil is uniform and full specified strength.

If you have not learned the advantages of NOPCOCASTOR first hand it will pay you to send for samples and technical data.

National Oil Products Co.

NATIONAL OIL PRODUCTS COMPANY

Chicago New York,

Starch

Eagle Finishing

The experience of critical operators has shown this popular brand to be the most efficient sizing agent, both for additional WEIGHT and increased STRENGTH of Warp. Penetration accomplishes these im portant results.

EAGLE FINISHING is specially manufactured to cover a wide range of fluidities to meet the needs of all classes of weaves.

EAGLE FINISHING penetrates.

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

COTTON—WOOL—SILK

DYED or BLEACHED in SKEIN

For Effect Threads

Fast to Bleaching

Delivered in Skein or Tube

PROMPT DELIVERIES—RIGHT PRICE

Backed by 18 years experience

Same Yardage delivered as received.

COUNT YOUR SKEINS.

Your Patronage Solicited

HABERSHAM KING JR,.

PLANT:

4-6 NORTH BUTLER ST., ATLANTA, GA.

"BRETON"
MINERAL "F"

For Plush and
Velvet Finishing

BORNE, SCRYMSER COMPANY
80 South Street, NEW YORK
BOSTON **PHILADELPHIA**
Works: Elizabethport, N. J.

The Grasselli Chemical Co.
DYESTUFF DEPARTMENT"
Works at:
GRASSELLI, N. J. ALBANY, N. Y.

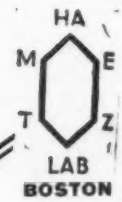
SULPHUR COLORS: Black, Blue, Brown, Green.
Direct Cotton Colors, Acid and Chrome Colors
MONOPOLE BRILLIANT OIL
Bichromate of Soda Sodium Sulphide
Zinc Dust, Chemicals and Acids

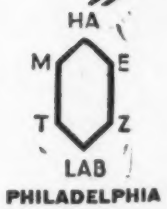
BRANCH OFFICES:

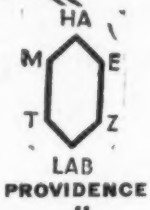
New York	Philadelphia	Birmingham	Charlotte	St. Paul
Boston	Chicago	Cleveland	Cincinnati	Providence
St. Louis	Detroit	New Orleans	Milwaukee	

The Grasselli Chemical Company, Limited
Toronto Hamilton Montreal

Sole Selling Agents for Essex Aniline Works, Inc., Boston, Mass.







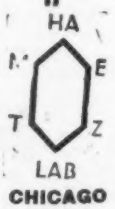
MORE than 40 years in the merchandising and manufacturing of dyestuffs has given us an insight into the intricacies of the many problems with which you are confronted and a wealth of information and experience which is always available to you.

We feel justified in soliciting your business by virtue of past performances and service, assuring you of our continued earnest desire to co-operate with and serve you.

Aside from the line of colors made in the U. S. by

CONSOLIDATED COLOR & CHEMICAL CO.
and
CENTRAL DYESTUFF & CHEMICAL CO.,

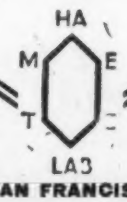
we will be glad to procure for you on Import Licenses that may be granted you by the War Trade Board such colors as are available and made by the Farbwerke-Hoechst, Farbenfabriken vorm. Fried. Bayer & Co., Leverkusen, Leopold Cassella & Co., Frankfurt, Kalle & Co., Bieberich, and Griesheim-Electron (Oehler) of Frankfurt. Licenses are granted for colors not made in the United States or not made in sufficient quantities or at reasonable prices. All products brought over on Licenses will be obtained by us at the lowest prices quoted for export to anyone or any Government by the manufacturers.



H. A. Metz & Company, Inc.

122 Hudson Street

New York



IMPROVE YOUR BLACKS

"DEVELOPENE"

Turns a *Rusty Black* to a *Lustrous One.*

THERE is no slight of hand connected with it. Send a pair of stockings, a skein of yarn or a sample of fabric, which has been dyed black, washed but not finished, to our Laboratory.

We will finish it with "Developene" and return to you. There will be such an improvement you will immediately want "Developene" for finishing your goods.

MANUFACTURED ONLY BY

Kali Manufacturing Co.

MANUFACTURING CHEMISTS

1404-1410 N. Front Street **PHILADELPHIA, PA.** 1409-1413 N. Hope Street

Salicylic Acid Prevents Fermentation of Size

Sole Manufacturers of Hydroxy Oil and Kali Chlorine Neutralizer—the Superior Anti-Chlor. Formaldehyde.

VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience

ZAVON

The Super Solvent

The manufacture of ZAVON, the well known textile solvent, has been taken over by a new company and extensive factories have been put in operation at Danbury, Conn.

Here in the new factories ZAVON will be manufactured on an extensive scale to supply the textile industry with this superior solvent.

In the kier, the open kettle, or for all softening purposes, ZAVON is superior to soaps and soluble oils.

Send for working samples of ZAVON and learn the advantages of this effective solvent.

AV ZON TRADE MARK

ZAVON COMPANY, Inc.

Danbury, Conn.

1872 1920

CHEMICALS, DYESTUFFS COLORS, GUMS, OILS

FOR THE TEXTILE INDUSTRY

HEADQUARTERS FOR

ACID, BASIC, DIRECT, CHROME and SULPHUR COLORS; "CIBA" and "CIBANONE" FAST VAT DYES

A KLIPSTEIN & COMPANY

644-652 Greenwich Street NEW YORK CITY

JACQUES WOLF & CO.

Manufacturing Chemists & Importers

MAIN OFFICE and WORKS: PASSAIC, N. J.

New York Office: 112 John Street.

HYDROSULPHITES

For All Purposes

All Sizing and Finishing Products for Cotton

Bensapol
Bleaching Oil
Cream Softener
Glasgow Sizing
Levuline
Soluble Oils
White Finish

MONOPOLE OIL

Reg. Trade Mark No. 70991

BOSSON & LANE

Manufacturers and Importers

Castor Oil and Castor Oil Products

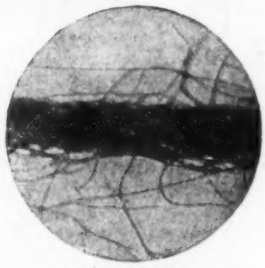
Turkey Red Oil	Soluble Grease
Alizarine Assistant	Soluble Wax
Castor Soap Oil	Soluble Rosin
Bleaching Oil	Olo Soffene
Monoline Oil	Snoflake Softener
Victroline	T. R. Soap
Soluble Oil	Oleine

Flaxhorn—The Delicate Finish.

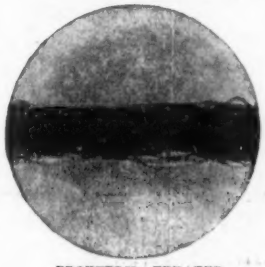
Works and Office: ATLANTIC, MASS.

SONNEBORN PRODUCTS

The Microscope Shows How to Increase Production



UNTREATED



PROPERLY TREATED

It costs you valuable production if your warp shows "flake off" and consequent break-off and mildew. Beef tallow, starch and water alone cannot prevent your warp from becoming like the micro-photograph at the left.
Dress your warp perfectly—make the fibres straight by the scientific Sonneborn process as shown at right.

AMALOL and GLUANTINE

in combination, form the perfect warp dressing. Amalol is the 100% softening agent, Gluantine the natural gum binder.
Many prominent New England and Southern cotton mills have adopted the modern Sonneborn method for "slasher" and "short chain" operations.
Tell us the number of your yarn and we will send the proper formula and a trial barrel each of Amalol and Gluantine.

Profit by the microscope's story. Investigate today and you will increase production.

Textile Products Division **L. SONNEBORN SONS, Inc.** 262 Pearl St., New York

SONNEBORN

Boston **Philadelphia** **Chicago** **Columbus, Ga.**

Midland Blue R

Midland Vat Blue 5 B

Are Vat Blues of special interest to all manufacturers of fast color Ginghams and Chambrays—of good fastness to washing, chlorine and light—suitable for both raw stock and yarn dyeing. For the same trade we also have some new sulfur colors of extreme brilliancy.

Aniline Dyes and Chemicals, Inc.

Cedar and Washington Streets **New York**

Mercerizing Gassing Bleaching

We have a new and strictly modern plant for mercerizing, gassing and bleaching.

Located as we are in the center of the combed yarn spinning industry of the South, we are enabled to furnish you with the highest quality processed yarns in all numbers.

The American Processing Company

Mount Holly, N. C.

NEW YORK REPRESENTATIVE:
H. B. ROBIE,
No. 346 Broadway,
New York City.

SELLING AGENTS,
THE RIDDLE COMPANY,
Mariner & Merchant Bldg.,
Philadelphia.

SURPASS CHEMICAL CO. FOR USE IN AUTOGYP PROCESS OF DYEING. AUTOGYP PATENTED IN U. S. A. SEPT. 20, 1910. IN CANADA OCT. 10, 1916. ALBANY, N. Y.

Bleaching **Dyeing**

One Operation
SIMPLE AS A B C's

The Material Direct from the Knitting Machine, is run into the dyeing machine, and thoroughly wet out in any convenient manner. Sufficient cold water to thoroughly cool the bath and in which to properly work the material is now run into the machine. 2 to 3 per cent of Autogyp dissolved in cold water and suitably diluted is now added to the bath. The necessary dyestuff in a well diluted solution is then slowly added to the bath and the goods allowed to run 10 minutes. Steam is then turned on and the bath allowed to come to a boil very slowly and gradually held at or close to a gentle boil for one hour; steam is then shut off and the goods allowed to run 45 minutes longer without steam.

The Bath is then drawn off and the goods rinsed twice and extracted.

—AND
THAT'S ALL.

Write for full information.

SURPASS CHEMICAL CO., Albany, N. Y.

Sole Agents for the South
The Color Service Corporation
534 Canal St., New York

Represented in the South by
A. S. Roberts
215 E. North St., Greenville, S. C.

AUTO GYP
Process of Dyeing

ESTABLISHED 1815

Arnold Hoffman & Co., Inc.,

PROVIDENCE, R. I. NEW YORK, N. Y.
BOSTON, MASS. PHILADELPHIA, PA.
CHARLOTTE, N. C.

Importers and Manufacturers of

STARCHES, GUMS, DEXTRINE, ALIZARINE ASSISTANT, SOLUBLE OIL, SOAP

And Every Known Material from Every Part of the World for Starching, Softening, Weighting and Finishing Yarn, Thread or any Fabric.

Special Attention Given by Practical Men to Specialties for

SIZING, SOFTENING, FINISHING AND WEIGHTING

Cotton, Woolen and Worsted Fabrics combining the latest European and American Methods. We Believe There is No Problem in

SIZING OR FINISHING

That We Cannot Solve.

FORMULAS for the best method of obtaining any DESIRED FINISH on any fabric cheerfully given.

FIG.20.

All our Baskets made from Lane Duck of our own weaving. By use of strictly long staple cotton and approved modern methods, unusually high tensile strength and wearing qualities are obtained.

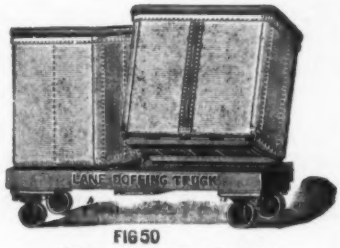


FIG 50

All frames made of highest grade Spring Steel, patented semi-flexible Eye-joints, affording a frame that YIELDS under strain instead of breaking or bending.

STURDY

Lane Canvas Baskets

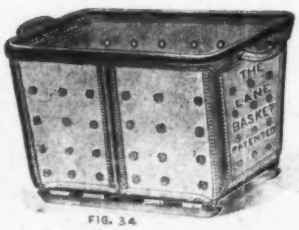


FIG. 34.

Lane Steamers made in both oblong and round. Materials used withstand heat, moisture, and handling to a degree found in no other basket.

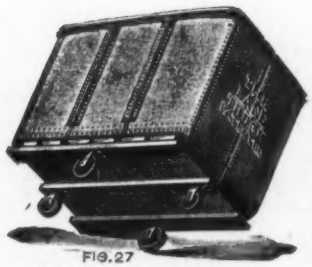


FIG.27

This truck embodies all the advantages of Lane Baskets, plus our specially designed Thread Guard Casters, which are, IN FACT, NON-CLOGGING. Furnished in either stationery or swivel frame style, of generous diameter and tread.

W. T. LANE & BROTHER, Manufacturers **Poughkeepsie, N. Y.**

Nickle-Plated Drop Wires

—IN ANY SIZE OR STYLE AT ONLY—

25c Per Thousand

above the price for regular finish. Our drop-wires are made of the best grade steel wire.

STEEL HEDDLE MANUFACTURING CO.

Greenville : Philadelphia : Providence

Southern Office, Hampton Smith, Mgr., 111 Washington Street, Greenville, S. C.

For the Happy Children of Contented Parents

When you provide happiness and enjoyment for the children of your employees it can be nothing else than a certain indication that you really have their interest at heart. Install Medart Playground Equipment in your community—watch the enjoyment it brings to the children—and, watch the increased contentment among your workers when they know that you are something more than just "the boss."

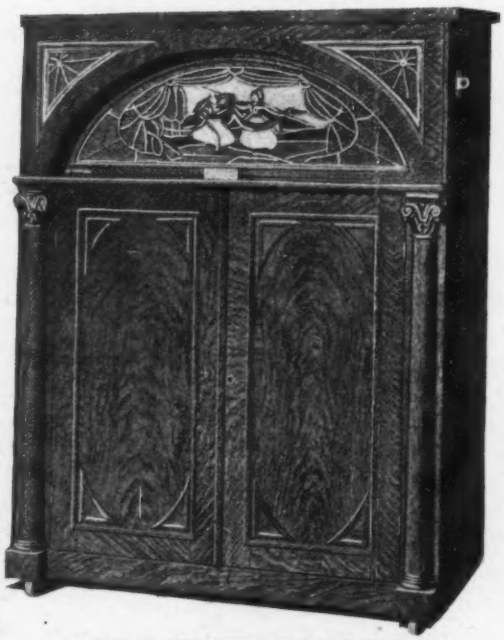
MEDART
PLAYGROUND EQUIPMENT

For 50 years the Medart Company has been manufacturing and perfecting gymnasium apparatus for vigorous men—an experience that has especially fitted it for the leadership it has always maintained in the development of playground equipment best suited to promote those bodily and mental qualities which mold today's childhood into tomorrow's man- and womanhood.

Catalog "L" fully describes Medart Playground, Swimming Pool, Gymnasium and Locker Room Equipment. Contains valuable suggestions for playground installations. It will be sent gladly to anyone requesting it.

Fred Medart Manufacturing Co.

Potomac & DeKalb Sts. St. Louis, Mo.
Gordon Lewis, District Manager, Walton Bldg., Atlanta, Ga.



STYLE K MIDGET ORCHESTRION

One of our small styles that is especially attractive where a small instrument is desired.

SEEBURG

Self Playing Musical Instruments are wonderful entertainers.

For Your

Recreation Rooms, Cafeterias, Motion Picture Theatres

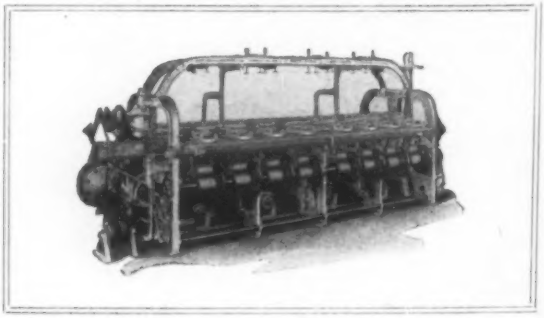
Simplicity—Reliability—Service

Scofield Auto-Music Company

CHARLOTTE, N. C.

Special agents for the Southeast.

Cotton Belting Looms



Fletcher Cotton Belting Looms are built from the best raw materials by the highest degree of mechanical skill.

They are strongly constructed
Have powerful, rigid frames
Are compact and easily operated
Are reliable under all conditions.

Recognized as the standard of quality everywhere, their highest development is reflected in the quality of belting they produce.

Complete descriptive matter on request, and our technical and engineering departments will gladly assist you with your problems.

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FLETCHER MULTI-CONE CLOTH

Producing to a New Selling Price

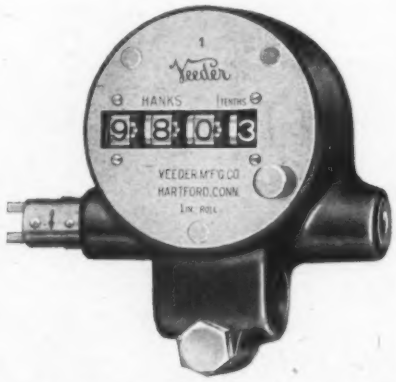
How can you adjust production to the lower selling prices that are bound to obtain if full operation is to be had?

By more production from each operative employed. Fuller employment of the capacity of machines in operation; putting **counters** on many of them.

By watching the production-records as machines work, setting standards or *tasks* for the operator and checking-up with

Veeder COUNTERS

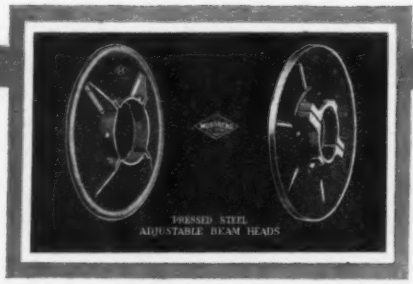
you can reduce operating costs and save profits from shrinkage with the selling price.



The Hank Counter illustrated above records the output of Spinning Frames, Mules, Cards, Lappers, Combers and any frame or machine where the product is ejected by rollers. Usually geared to measure in hanks of 840 yards each, and reads in plain figures. This counter is built especially and exclusively for textile machinery; its mechanism will stand service under **textile mill conditions;** it is not an adaptation of a counter for general machine use. Specially built models for other textile machines are shown in the Veeder booklet—copy sent gladly.

The Veeder Mfg. Co.

6 Sargeant St. Hartford, Conn.



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STEEL REELS, BEAMS AND SPOOLS

BEAMS, Spools and Reels made of Pressed Steel are decidedly superior to those made of wood or cast-iron. They are stronger and lighter.

Mossberg Pressed Steel Construction is being utilized by mills the country over. Mossberg Equipment is saving time and money wasted by frequent changing and purchasing.

Write for interesting catalog on Pressed Steel Equipment. It is instructive and valuable.

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President and General Manager
FRANK T. CHASE
Treasurer and Sales Manager
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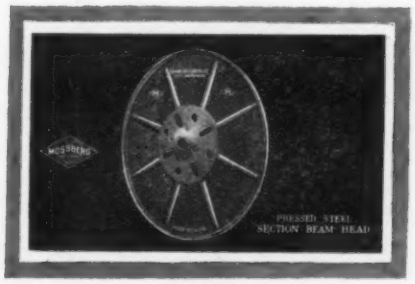

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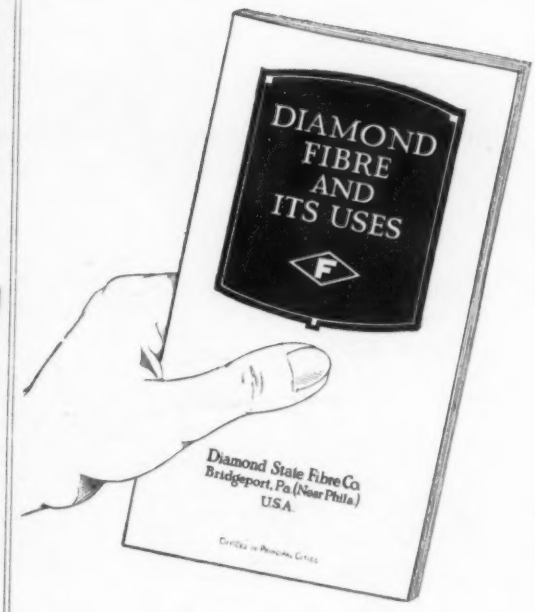

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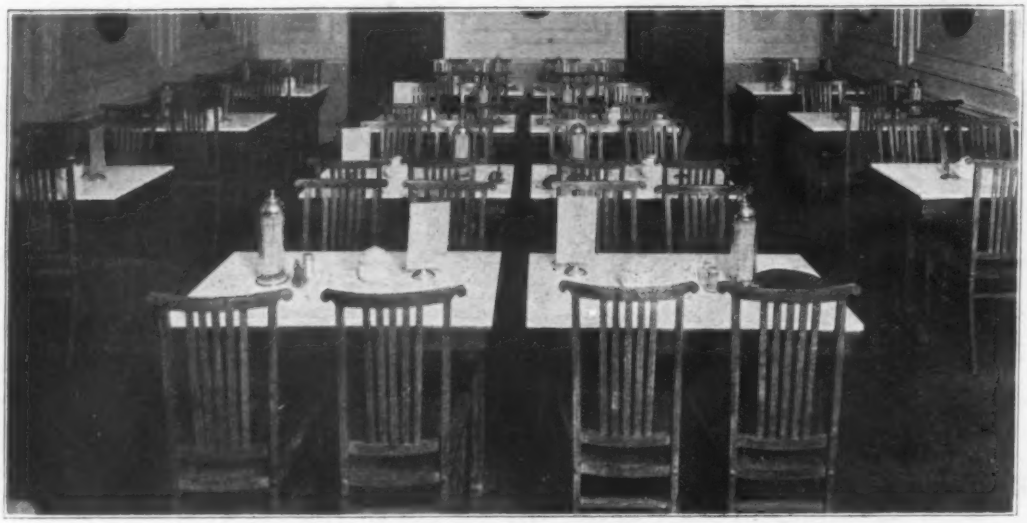
THE WRIGHT EQUIPMENT

For Your Mill or Factory



A CLEAN SANITARY DINING ROOM

We build special equipment for your cafeteria, kitchen and dining room complete in every detail. Shipments made promptly. Write for information how to increase your production.

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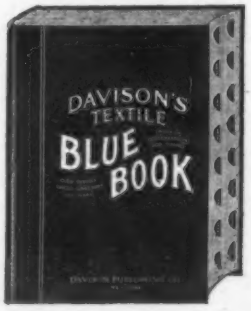
Commission Merchants



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Specialists in Hotel and Cafeteria Equipment.

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A First Aid Room or an Emergency Hospital For Your Employers will

Decrease your liability for industrial accidents.

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F. H. Thomas Co.

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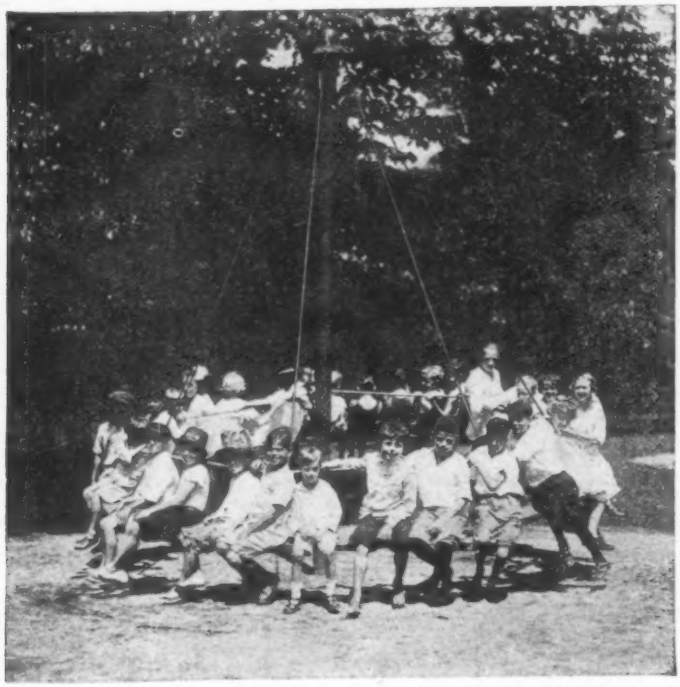

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BE SURE

YOUR PLAYGROUND SPECIFICATIONS INCLUDE

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

THE LAST WORD IN IMPROVED PLAYGROUND EQUIPMENT.

BUY *NOW*, and be assured of prompt delivery. Installation can be made this fall, avoiding early spring rush and attendant delays.

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We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity. None too small to receive careful attention.

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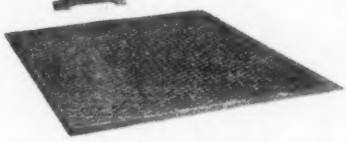
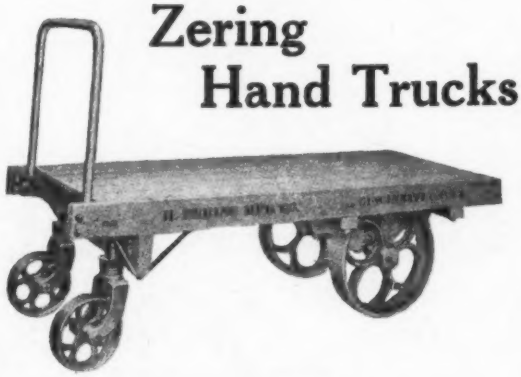


Zering Hand Trucks



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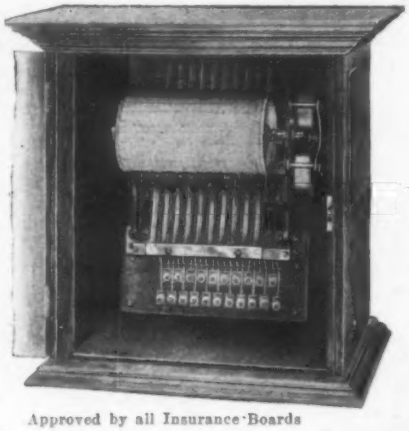

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It lives up to its name, as it is absolutely universal and can be used anywhere a counter is required, as a two-in-one stroke counter or revolution counter. Three types, outside reset, non-reset and inside-reset.

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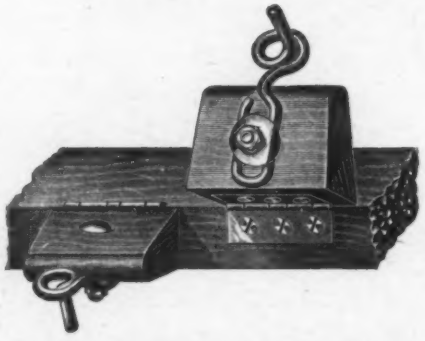
The Palmer Adjustable Thread Guide



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Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

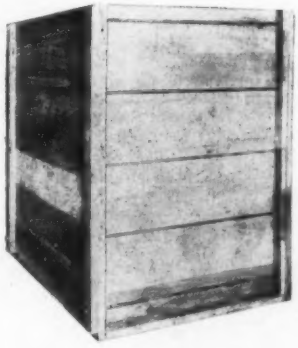
Wooden Packing Cases

All Styles
Manufactured from
Georgia Pine
White Pine
Poplar
Cypress
and Gum

The interlocking packing case, shown in the upper left-hand corner, has advantages over other packages, especially for carrying heavy materials. In the first place lighter weight material can be used in its construction on account of the interlocking reinforcement. It is harder to pilfer or break open than other packing cases.

We are now in position to give all orders for shooks prompt attention, and will be glad to quote prices and delivery dates on any cases you might require.

In addition to rectangular tanks, we manufacture a complete line of round tanks equipped with round iron hoops and malleable draw lugs.



All our tanks are manufactured from heart cypress tank stock and we guarantee them to hold water.

Your inquiry solicited.

Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets

Box 1025 **Atlanta, Ga.**

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CONVINCING COMPARISON
SHOWS THE SUPERIORITY OF

SIGNODE STEEL STRAPPING SYSTEM

OVER THE USUAL BALE TIE.
LET US SEND YOU FULL DETAILS
SIGNODE SYSTEM, INC.
CHICAGO ATLANTA
Boston New York Philadelphia San Francisco
Toronto

⅝" x .015 SIGNODE TIE	COSTS 12 % LESS PER FOOT	HOLDS UNDER 800 LBS. PULL	NO "SPIDER" TO INJURE HANDS
Compared with			
USUAL ⅝" x .017 BALE TIE	COSTS 12 % MORE PER FOOT	BREAKS UNDER 500 LBS. PULL	DANGEROUS "SPIDER" OFTEN PRESENT

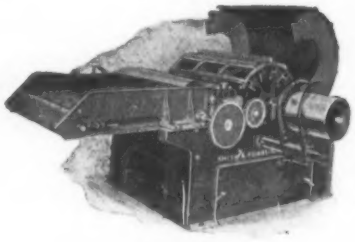
SPOOLS

Let us submit prices and samples on WARPER and TWISTER SPOOLS. Plain wooden head and metal shield. A list of Southern Mills using spools given on request.

Greenville Spool & Mfg. Company
Greenville, S. C.

SMITH & FURBUSH
MACHINE CO.
PHILADELPHIA, PENNA.

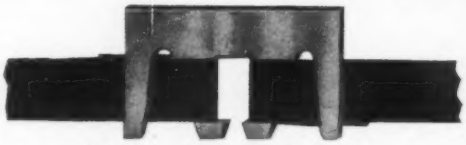
Specialists in machinery for working all kinds of Waste Products. Complete equipment for coarse yarns, etc., from waste. Shoddy, Felting and Woolen machinery.



Jute Picker
Send for Circular S-166

This machine is used for shredding or hackling out Gunny and Burlap bagging.

It is used as a part of our outfit for the manufacture of gunny sacking from scrap bagging.



Acme No. 9 Bale Buckle

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with
Acme Bale Buckles
or
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Acme Steel Goods Co., Mfrs.

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THE KRON IN A PROMINENT TEXTILE MILL.

You can figure for yourself what this modern method of weighing means in the saving of time and labor.

Save

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"Load and Look"

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AUTOMATIC Made in U. S. SPRINGLESS

All Metal Construction

There's a Kron for Every Weighing Purpose

ALL TYPES—ANY CAPACITY—Dormant or Portable, Hanging Pan Types, Overhead Track Scales, Suspension Crane Scales, Etc.

Write for a copy of our new catalogue.

American Kron Scale Co.

430 East 53rd St., New York

Branch Offices & Service Stations in Principal Cities

CANADIAN KRON SCALE CO., MONTREAL, CAN.

White Hickory

BUILT ON HONOR

Judge Them By The Miles of Service

Miles of Service are assured by these Units.

Continental Red Seal Motor, Eiseman High Tension Magneto, Sheldon or Timken Worm Drive Axles, Timken Bearings and all other units of highest standard grade.

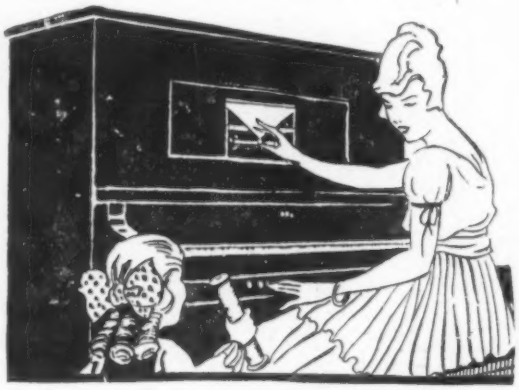
The initial cost of a motor truck is only a percentage of the total transportation cost. It is *Miles of Service* that count.

You can rely on White Hickory Trucks. They stand up under adverse conditions—they give miles of service at an extremely low hauling cost, with any kind of a load, on every kind of road.

Back of the White Hickory Truck is the forty year record of the White Hickory Wagon.

White Hickory Motor Corporation

Atlanta, Georgia, U. S. A.



STIEFF

We venture to say that there is no town, hamlet, village or city in this section of the country where there is a better known piano than the Stieff. The chief reason for this is the unvarying quality of the instruments as well as the reasonable terms upon which they are sold.

Write today for catalog and prices.

PIANO TUNING.

Chas. M. Stieff, Inc.

M. D. MANNING, Manager

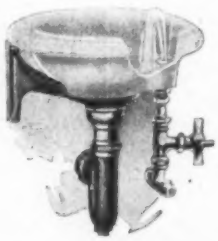
215 South Tyron Street Charlotte, N. C.

R-S SANITARY FOUNTAINS

ONE of the greatest sources of, and aids in, the spreading of disease is the drinking fountain, public or private, if the water jet is vertical.

SCIENCE has PROVEN this as an indisputable fact by actual test. It's NOT A THEORY.

The vertical stream falls back into the fountain head germ-laden from the drinker's mouth to be carried to the mouth of the next drinker.

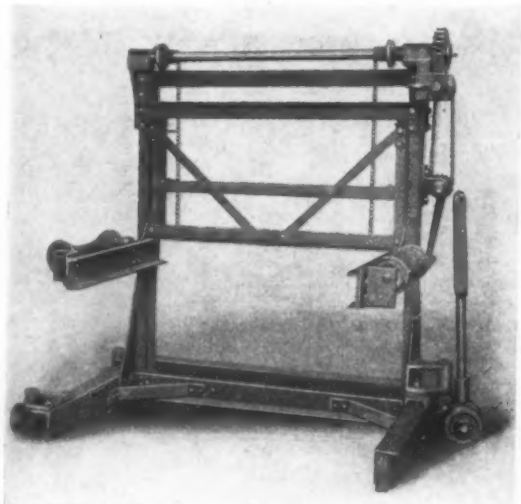


"VERTICO - SLANT" STREAM FOUNTAINS have been especially designed to do away with this menace by jetting water at an angle that does not permit it to fall back to the fountain head.

Our Fountain Equipment is Simple Yet Absolutely Sanitary

Let Us Tell You. Write for our new 74-page catalog.

RUNDLE-SPENCE MFG. CO.
MILWAUKEE WIS.



One Man Handles All Beams

Our portable elevators have many applications and serve many purposes around the mill. The design shown above is saving time and labor for mills, as with it one man can handle the heavy warp beams, move them about from place to place and set them in position on the loom.

Without obligation, one of our representatives will gladly call on you and tell you frankly what our equipment can do for you.

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Economy Engineering Co.; Tiering Machines.
Automatic Transportation Co., Storage Battery Trucks.
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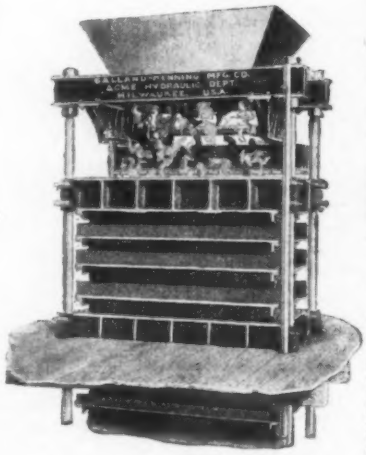
J. D. COLLINS Nint's Floor Grant Bldg. **ATLANTA, GA.**



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Patents Pending

Load 50,000 lbs. in Car.

This is what can be accomplished with these powerful Balers and it is not necessary to pile the bales but merely set them on end.

LESS LABOR
MORE RAPID
LESS FLOOR SPACE

Send for catalog.

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Milwaukee, Wis.
Southern Sales Representatives
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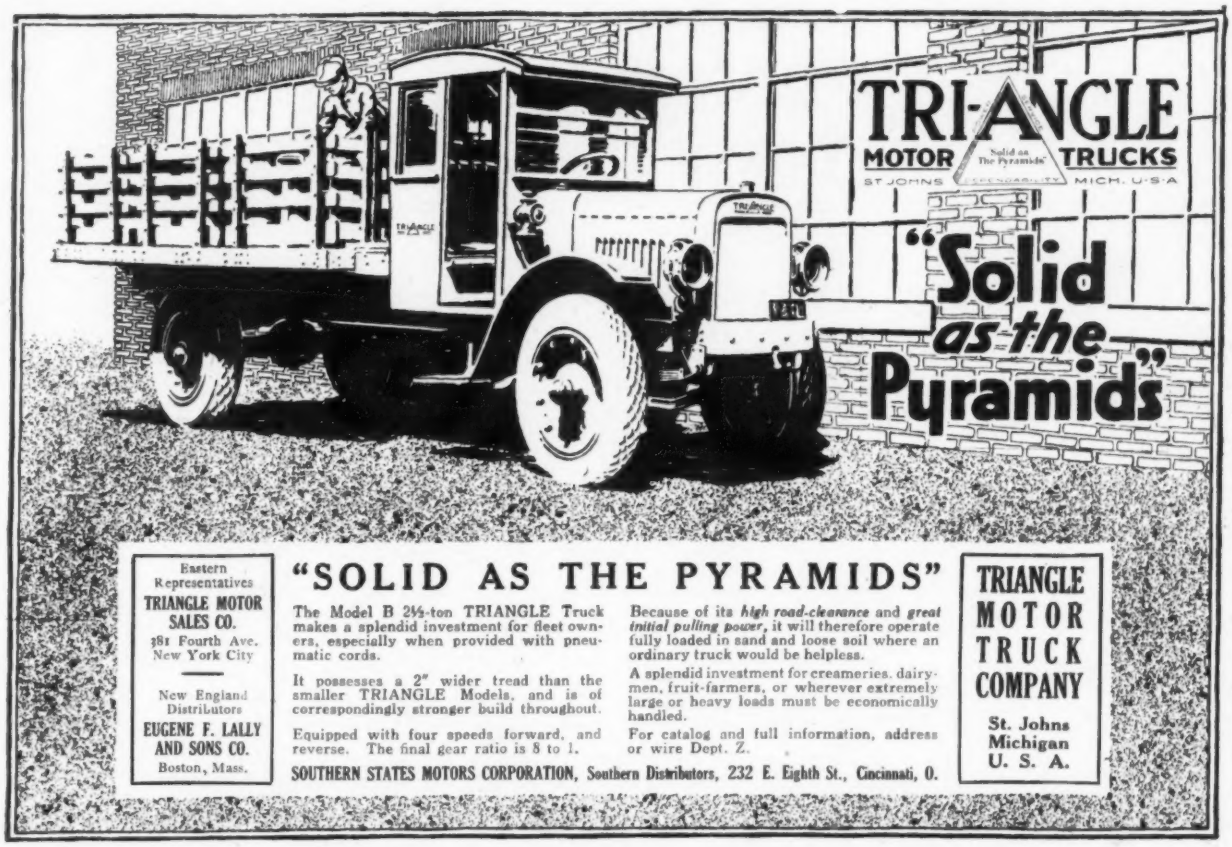

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EUGENE F. LALLY AND SONS CO.
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"SOLID AS THE PYRAMIDS"

The Model B 2½-ton TRIANGLE Truck makes a splendid investment for fleet owners, especially when provided with pneumatic cords.

It possesses a 2" wider tread than the smaller TRIANGLE Models, and is of correspondingly stronger build throughout.

Equipped with four speeds forward, and reverse. The final gear ratio is 8 to 1.

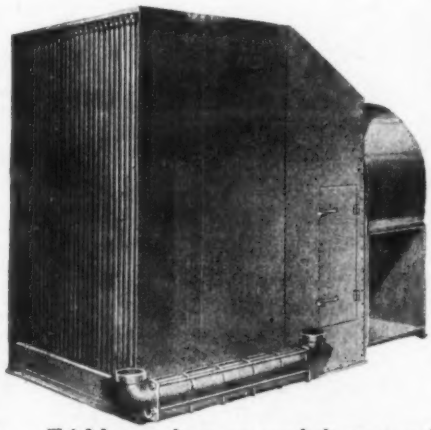
Because of its *high road-clearance* and *great initial pulling power*, it will therefore operate fully loaded in sand and loose soil where an ordinary truck would be helpless.

A splendid investment for creameries, dairymen, fruit-farmers, or wherever extremely large or heavy loads must be economically handled.

For catalog and full information, address or wire Dept. Z.

SOUTHERN STATES MOTORS CORPORATION, Southern Distributors, 232 E. Eighth St., Cincinnati, O.

TRIANGLE MOTOR TRUCK COMPANY
St. Johns Michigan U. S. A.



Seri-Vane Fans

Cut shows a compact heating unit as regularly installed by us for large Factory and Industrial Heating and Ventilating units. The large range of adaptability for our fans, heaters, air washers, etc., is clearly brought out in catalog No. 70.

We have lately prepared a special treatise devoted to paper drying and kindred products which we think will prove of value to those manufacturers who desire to increase their production and the quality at the same time. Ask for Bulletin No. 11.

If we cannot truthfully show you where a SERI-VANE FAN can do your work better and save you money at the same time, we say so frankly. We do not try to force a sale but gladly make any suggestions or recommendations which our experience knows to be practical and feasible, and then allow the customer to decide freely from the facts presented. There is positively no string attached to our engineering advice.

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Cotton Mill Machinery and Supplies

Electrical Apparatus Steam Plants

Complete Equipments Bought and Sold

CAROLINA SUPPLY COMPANY

CORNER OF COURT AND JACKSON STS., GREENVILLE, S. C.

The Home of all First Class Cotton Mill and Electrical Supplies

BE SURE TO VISIT OUR PLANT WHILE AT THE EXPOSITION.

A Hearty Welcome Awaits You.

WE PACK CAREFULLY AND SHIP PROMPTLY
WE GIVE YOU WHAT YOU WANT WHEN YOU WANT IT

"SERVICE ALWAYS"

THE WILSON CO.

TEXTILE MACHINERY AND SUPPLIES

Structural Steel

Fibre Receptacles, Belting, Wooden Loom Parts,
Roller Leather for Covering Spinning Rolls,
Packings of all kinds, Slasher Cloths, Etc.

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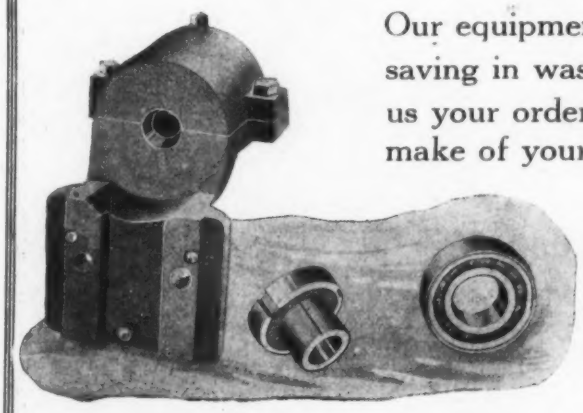
Detroit, Mich.

CUT DOWN ON THE WASTE!

Get your Yarn into the Cloth Room instead of the Waste Bin

A great part of your soft waste is due to inaccurate measuring on warpers. Ball bearings on the measuring rolls will make the rolls more sensitive, and the measuring more accurate.



Our equipment is simple and easy to install. The saving in waste soon pays for the bearings. Send us your order for an outfit of bearings. giving the make of your warpers.

AldricH MachinE WorkS

Ball Bearings

Greenwood, S. C.

The Perfect Roofing Material for Renewing and Repairing Old Roofs

(Registered U. S. Patent Office)

Any old leaky roof, no matter what kind—gravel, composition, tin or iron—no matter what condition it's in—can be made better than new, weather-proof, crack-proof, decay-proof, with a 1/16 inch coating of GILSO-CEMENT.

GILSO-CEMENT is a combination of the best preservatives together with asbestos fibre and oils which thoroughly seals up every crack and crevice in a roof, forming a tough, elastic, one piece covering which withstands the worst weather conditions. Its non-drying oils thoroughly saturate the old basis, preventing its further decay.

GILSO-CEMENT will prove a good investment to you as well as it has to many other plants. Practically every railroad in the country has standardized it for old roof renewing purposes. Testimonials from hundreds of other manufacturing plants sent on request.

Write today for prices.

The High Grade Manufacturing Company

Cleveland, *Ohio*

VOGEL PATENTED

FROST PROOF CLOSETS

They require no pit.
They save water.

All bowls have enameled rims. In service daily, winter and summer.

No. 1

OVER 350,000

Giving

Satisfaction in All Climates

The ideal water closets for Factories and Mill Villages, where thousands have been installed.

The most durable water closets made — excepting none.

Every Fixture Tested Under Hydraulic Pressure Before Leaving Factory.

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Ask your jobber

JOSEPH A. VOGEL CO.

Factory and Office at
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VOGEL PATENTED

No. 5 FACTORY CLOSET

This fixture fills the demand for a strong and durable automatic water saving closet outfit for factory use. The valve device is extremely simple and repairs, though seldom necessary, can be made by removing the valve cap back of bowl.

Kaustine

Sanitary Sewage Disposal Systems

Better Morale in *Your* Mill Village

THE better class of workmen ***seek*** the ordinary conveniences and comforts of home life, which you ***demand*** for yourself. They know that their productive power and earning capacity are dependent upon their physical condition as well as upon their mental state.

Kaustine Sanitary Equipment installed in mill homes provides the comfort and refinement essential to healthy, contented inhabitants of unsewered mill villages.

It is complete and scientific in every respect—endorsed by health boards everywhere, because of the thorough and adequate manner in which it disposes of fecal matter immediately after discharge from the body. It affords the convenience of a city water toilet.

To insure an ample supply of reliable labor, every mill village in an unsewered area should be equipped with a Kaustine Chemical System, or Hydro-Kaustine Septic Tanks. It is welfare work that returns big dividends.

Send for our catalog H, which shows how Kaustine equipment solves the problem of sanitation in unsewered areas, and provides the convenience that keeps men healthy and satisfied.

KAUSTINE COMPANY, Inc.

Manufacturers and Sanitation Engineers

Buffalo, N. Y. Toronto, Can. Melbourne, Australia.

Southern Representatives
J. L. Murphy, Charlotte, N. C.
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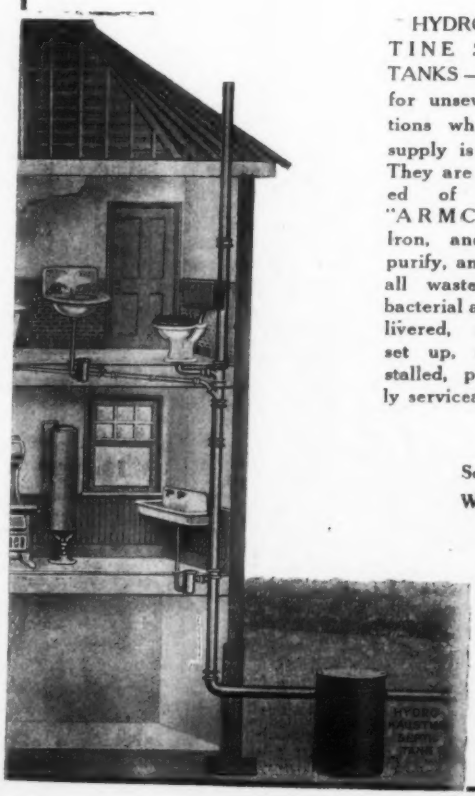
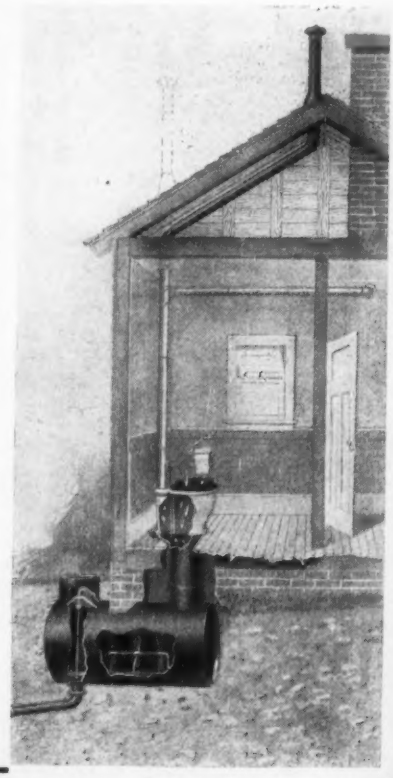


HYDRO - KAUSTINE SEPTIC TANKS — designed for unsewered sections where water supply is available. They are constructed of enameled "ARMCO" Ingot Iron, and liquefy, purify, and disperse all waste through bacterial action. Delivered, ready to set up, easily installed, permanently serviceable.

KAUSTINE (CHEMICAL) TOILET SYSTEM—for unsewered sections WITHOUT WATER supply. Disposes of sewage thru chemical action which liquefies and purifies it. Perfect ventilation system makes it odorless. All metal parts constructed of enameled Armco (the pure) Iron. No pumping or dipping of tank contents — turning drain valve disposes of purified contents through leaching pool.



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Some desirable territory open.

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Buffalo, N. Y.

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We have moved our business from

EAST CAMBRIDGE, MASS.,

to

561-575 ALBANY STREET, BOSTON, 18, MASS.

Where we have increased facilities and are better equipped for the manufacture of

CARLISLE FORCE-DRAFT VENTILATORS

EXHAUST AND BLOW PIPE SYSTEMS

and

GENERAL SHEET METAL WORK

CARLISLE & GALE COMPANY

Creosoting Industrial Timbers Is ECONOMY

CARBO, FIRST GRADE REFINED CREOSOTE OIL

Meets all requirements of the United States Government Shipping Board Emergency Fleet Corporation, Specification G174-A-1 and the United States Railroad Administration, Specification R-828-A.

The cheapest sap wood timbers, especially sap wood pine shingles treated with this oil **will outlast the highest grade woods untreated.**

NUMBER ONE CRUDE CREOSOTE:

An economical wood preservative for open tank or brush treating wood shingle roofs, or structural timbers. This material when properly applied greatly lengthens the life of the cheaper timbers.

PURE CREOSOTE DISINFECTANTS COEFFICIETS ONE TO TWENTY.

Each shipment tested by Ridell-Walker method and guaranteed as to carbolic strength.

Our standard disinfectants are free from sediment and tarry matter and upon dilution with water form rich, cream-like emulsions (no oily float on top nor deposit at bottom). Emulsions do not separate on standing.

Our disinfectants are manufactured by the largest Manufacturer of coal-tar products in America and are absolutely uniform.

Gulf States Creosoting Company

17 Sampson Street, ATLANTA, GA.

THE trend in scientific lighting of textile workrooms is toward the general illumination system, which floods the entire interior evenly with light. This does away with the sharp lights and shadows which are characteristic of the old fashioned method of localizing lights over work benches and machines.

When you "Sun-Surface" walls with Hampden *Sunray* Mill White Oil Paint you not only light workrooms completely in the daytime but make possible a more economical flood lighting system at night. Dark or dirty walls absorb electric light as well as sunlight and Kilowatt hours must be paid for.

Hampden *Sunray* Mill White Oil Paint coats interiors with a long lived snow white surface which diffuses light like tile or porcelain. It is tough but elastic and will not crack and chip off under conditions of excessive vibration, which often destroy paint. When applied it shows no brush marks and the surface is so smooth that dust or dirt do not easily cling to it. If the surface does become soiled it may be washed down without injury.

Further particulars mailed on request, also our booklet "Whitest White," which contains useful information about industrial lighting.

HAMPDEN PAINT & CHEMICAL CO.

Makers of good paint for 68 Years

Division E **Springfield, Massachusetts**

A partial list of OUR CLIENTS

What better evidence of ability and reliability can a service organization offer, than a clientele of highly successful manufacturers? Performance must equal promises given to retain confidence year after year.
The following list of leaders in the textile field is representative. Space does not permit us to print the names of the many other clients whom we serve.

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Anchor Duck Mills, Rome, Ga.
Androscoggin Mills, Lewiston, Maine
Ansonia O. & C. Co., Ansonia, Conn.
Aurora Cotton Mills, Aurora, Ill.
Bancroft, Joseph & Sons, Co., Wilmington, Del.
Bates Manufacturing Co., Lewiston, Maine
Bemis Brothers Bag Co., St. Louis, Mo. also Boston, Mass.
Blackstone Mfg. Co., Blackstone, Mass.
Boston Manufacturing Co., Waltham, Mass.
Columbus Mfg. Co., Columbus, Ga.
Cosmos Cotton Co., Ltd., Yarmouth, Nova Scotia
Dallas Manufacturing Co., Huntsville, Ala.
Dallas Cotton Mills, Dallas, Texas
Dwight Manufacturing Co., Alabama City, Ala. also Chicopee, Mass.
Eagle & Phenix Mills, Columbus, Ga.
Grana, Antonio Lima, Peru
Great Falls Mfg. Co., Somersworth, N. H.
Griffin Manufacturing Co., Griffin, Ga.
P. H. Hanes Knitting Co., Inc., Winston-Salem, N. C.
Hankow Cotton Mill, Hankow, China
Henderson Cotton Mills, Henderson, Ky.
Hill Manufacturing Co., Lewiston, Maine
Hoosac Cotton Mills, North Adams, Mass.
Hua Hsin Mill, Tien Tsin, China
Imperial Cotton Co., Ltd., Hamilton, Ontario
Indian Head Mills of Ala., Cordova, Ala.
International Cotton Mills, Hogansville, Ga.
Lancaster Mills, Clinton, Mass.
Lawton Mills Corp., Plainfield, Conn.
Lockwood Co., Waterville, Maine
Lonsdale Co., Lonsdale, R. I.
Lowell Weaving Co., Lowell, Mass.
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Mollohon Manufacturing Co., Newberry, S. C.
Monadnock Mills, Claremont, N. H.
Monument Mills, Housatonic, Mass.
Nashua Manufacturing Co., Nashua, N. H.
Naumkeag Steam Cotton Co., Salem, Mass.
Newberry Cotton Mills, Newberry, S. C.
Newmarket Mfg. Co., Newmarket, N. H.
New Bedford Cotton Mills Corp., New Bedford, Mass.
Nyanza Mills, Woonsocket, R. I.
Otis Company, Ware, Mass.
Pacific Mills, Lawrence, Mass.
Pacolet Manufacturing Co., Pacolet, S. C.
Palmer Mills, Three Rivers, Mass.
Pelzer Manufacturing Co., Greenville, S. C.
Pepperell Manufacturing Co., Biddeford, Maine
Queen City Cotton Co., Burlington, Vt.
Riverside & Dan River Cotton Mills, Danville, Va.
Scranton Lace Curtain Co., Scranton, Pa.
Skenandoa Cotton Co., Utica, N. Y.
Slatersville Finishing Co., Slatersville, R. I.
Soule Mills, New Bedford, Mass.
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Tung Yeh, Shanghai, China
Utica Steam & Mohawk Valley Cotton Mills, Utica, N. Y.
Utica Knitting Co., Utica, N. Y. also Sherburne, N. Y.
Waltham Bleachery, Waltham, Mass.
West Point Mfg. Co., West Point, Ga.
Winnsboro Mills, Winnsboro, S. C.
Yu Yen Cotton Mill, Tien Tsin, China
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These days, when sales greatly outnumber production, are you slowing up your workmen with dark and gloomy workrooms? If so, brighten them up with Dixielite, the original daylight saver. It lengthens working days without increasing working hours.

Men and women work faster in light, cheery surroundings. Dixielite, the perfected white enamel finish for walls and ceilings, makes lighter, brighter rooms. It saves the eyes of your employees and increases the accuracy and quality of their work; makes working conditions more hygienic; and reduces accidents due to poor light to a minimum.

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Dixielite is made for mills, factories and warehouses. It invites daylight to your workrooms and diffuses it to the furthermost and darkest corners. It furnishes natural light to work by every minute of the day until Old Sol drops behind the horizon.

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A paint, varnish, stain, or enamel to fill every need. INOROUT Varnish does every kind of Varnish work. It is all Varnishes in one. You can't beat it.

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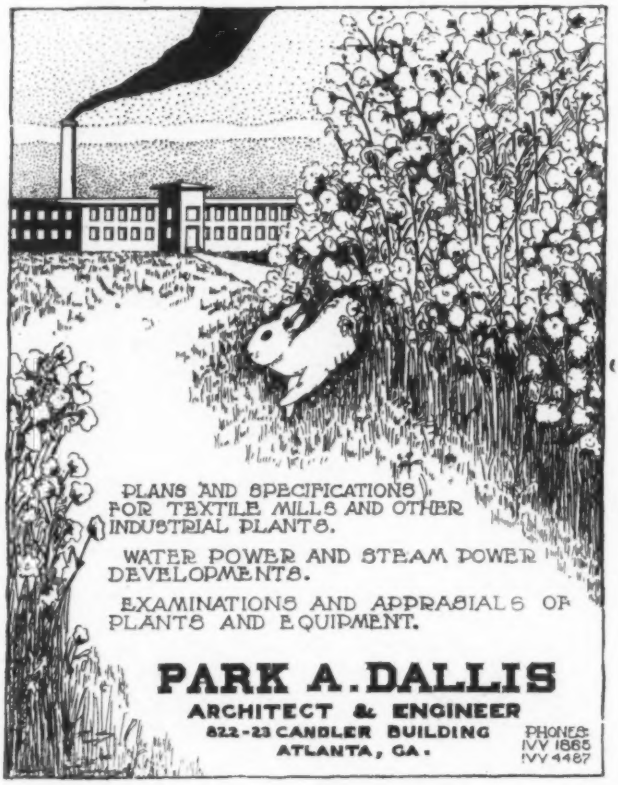
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"Best for the Southern Climate"

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For Shingle roofs and weather-boarding

C-H Home Paints
For Exterior and Interior Use

C-H Perma White
Interior gloss mill paint

Let us Send Booklet and Color Card Also names of Mills and Mill Contractors that have used our paints

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Just write on your letter-head— "Send Your Catalog"

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Manufacturers of paints, stains and varnishes
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Familiar Doors Equipped With R-W Door Hangers

Chicago Municipal Pier

There are more than 2,800 sliding doors in this Pier, hung on over 5,700 R-W Hangers. The R-W trolley track required to support these doors, if laid end to end, would extend six miles.

For particular information about Richards-Wilcox Door Hangers, "OveR-Way" Conveying Equipment and other haraware, write

RICHARDS-WILCOX R&W CO. AURORA TRADE MARK

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides."

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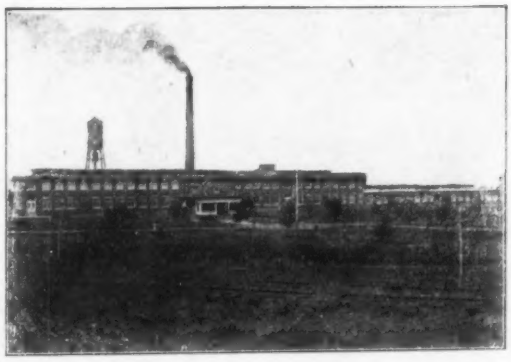

Dunson Mills, LaGrange, Ga.

A painting organization with a long record of large undertakings and successful achievements. The benefits of our twenty years of mill and factory painting are at your service.

Will you allow us to give you for a minimum cost, a maximum of returns?

Our belief is that we have reduced the painting of mill interiors to a science. We have so standardized the handling of painting equipment that it can be erected quickly; the painting is carried on in a manner not to interfere with the running of machinery or the work of the operatives; and the whole work is so handled that it does not expose to injury the goods in process of manufacture.

In connection with painting, the item of repairs to mill villages is one of considerable importance, and one which can be most economically handled at the same time and under one contract. We have handled several mill communities in this way, securing in all cases, results that have been most satisfactory.

Plants now being done or recently completed:

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Wateree Mills	Camden, S. C.
Winnsboro Mills	Winnsboro, S. C.
Pacific Mills	Columbia, S. C.
Hogansville Mills	Hogansville, Ga.
Dunson Mills	LaGrange, Ga.
International Cotton Mills	LaGrange, Ga.
Indian Head Mills	Cordova, Ala.

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Northern Office:
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Dunson Mill Village

GEORGE DOWMAN

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FIRE PROOF SPECIALTIES IN SHEET METAL AND ROLLED STEEL

HYDRAULIC STEEL BUILDINGS

WE ARE PREPARED TO FURNISH

Hydraulic Steel Buildings	Fire Door Hardware	Tin Clad Fire Shutters	Slate Roofing
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Tin Clad Doors	Elevator Hangers and Tracks	Toilet Partitions (Steel)	Ventilators
Kalameined Doors, in galvanized Iron, Copper or Bronze	Hollow Metal Elevator Enclosures	Office Partitions (Steel)	Metal Cornices
	Elevator Safety Gates	Blow Pipes	Metal Awnings
Rolled Steel Sash	Overhead Carrier System	Metal Stairs	Side Walk Lights
Folding Doors	Telescopic Hoists	Fire Buckets and Tanks	Hollow Metal Casements
Elevator Doors	Hollow Metal Windows	Metal Ceiling	Solid Steel Casements
Underwriters Iron Doors	Kalameined Windows in Galvanized Iron, Copper and Bronze	Ceiling Lights	Registers and Grilles
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Manufacturers of

High Grade Leather Belting

TEXTILE STRAPPING and SPECIALTIES

Sole Southern Representatives for

The Helburn-Thompson Co., Salem, Mass.

Manufacturers of

The Famous "WITCHCRAFT" Tannage Sheepskins

Large stock carried in Greenville

Reworking Old Belts a Specialty

Expert Belt Service Day or Night

THE GREENVILLE BELTING COMPANY

GREENVILLE, S. C.

THE JOHNSON FRICTION CLUTCH

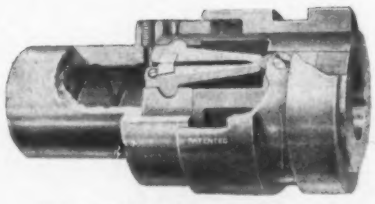
A Better Control for Textile Machinery

You will find the Johnson Clutch a most satisfactory means of driving textile machinery. More efficient and more convenient than the tight and loose pulley. Equally desirable on motor drives.

Made in both single and double types to fit standard pulley sizes. Clean, compact and durable. Grips smoothly and is easily adjusted to any tension.

Ask for the Johnson Clutch on your new machine equipment.

Ask for our Catalog "G"



Single Clutch Broken Away.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN

Brazing—Oxy-Acetylene and Thermit

WELDING

Over ten years of practical experience in brazing and welding all kinds of machinery and equipment enables us to offer efficient service to the cotton and knitting mills.

Parts shipped to us welded and returned promptly.

Or wire us, and one of our first-class machinists and practical welders will come to your plant and weld your job for you.

Boiler Welding A Specialty

CHATTANOOGA BRAZING & WELDING CO.

1309 Chestnut St., Chattanooga, Tenn.

Don't Miss This

This attachment is made for your drill press. It mills internal keyseats for straight or taper keys. Mills keyseats in one cut by a rotary cutter. The tool can be used in any shop—large and small. It mills keyseats in places shaper, planer and keyseating machine can't reach. Keyseats exactly opposite or quartered can be milled with mathematical accuracy.

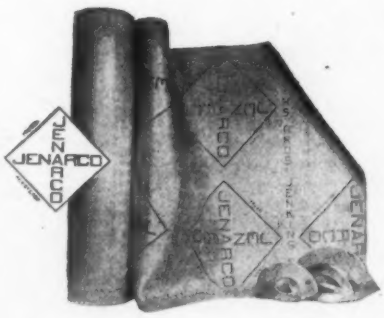
Just the tool you want to use for your interchangeable work. Clamping or chucking can be eliminated, the work being held by hand. The tools are made in twenty different diameters. Eccentric bushings are made for each diameter so that all tools can be bushed to meet any diameter above their own. This tool is a quantity producer and is used where parts are keyseate by thousands. More than 5,000 tools in use.

Get Catalog C

National Machine Tool Co.

2274 Spring Grove Ave., Cincinnati, O., U. S. A.

strong
tough
durable



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Jenarco is a vulcanized rubber sheet packing, dark red in color, that makes *absolutely tight joints* on lines carrying steam, hot or cold water, and other fluids.

The Jenkins line of Mechanical Rubber Goods also includes: Jenkins '96, the standard black packing; Magnolia Sheet Packing; Oiltite Sheet Packing, Jenkins Compressed Asbestos Jointing, for High Pressure, Superheated Steam; Valve Discs, Pump Valves; Gaskets; Tubing; Washers, Rings; and Fuller Balls—at supply houses everywhere. *Send for our new Catalog.*

JENKINS BROS.

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2190-J

Jenkins Packing

JENARCO 96 96 96 96 96 96

JEWELL BELTING

150 Years!

A century and a half of conscientious manufacturing and fair trading is a record of which to be justly proud in a country as young as ours.

To the Jewell Belting Company this record has the greater and more valued significance of representing a continuity of good will tendered by five generations of American manufacturers.

To have earned this good will is an indication in favor of the ideals, the fundamental principles, and the standards upon which the Jewell Belting Company has built its policy.

Hartford, Connecticut.

CRESCENT BELT FASTENERS

For every kind of belt, wide or narrow, high-speed, light or heavy duty.

They effect a powerful won't-let-go grip that spells economy in power, time, labor and belt maintenance, with safety thrown in for good measure.

None of the belting fabric is cut or punched away when you join a belt with Crescent Belt Fasteners—the joint is the strongest point in the belt instead of the weakest.

Try Crescent Belt Fasteners on any of your belts. Advise us the width and thickness and pulley diameters on any drive you would like to try them and we will send you samples. Write for Booklet M-1 on Increasing Belting Efficiency.

CRESCENT BELT FASTENER CO., 301 Fourth Ave., New York
Crescent Belt Fastener Co., Canadian, 32 Front Street, West, Toronto, Canada
England: 32 Paradise St., Birmingham.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY

ENGINEERS—FOUNDERS—MACHINISTS

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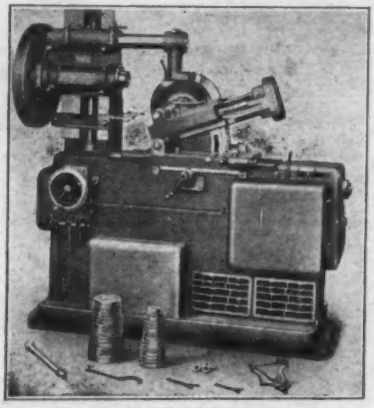
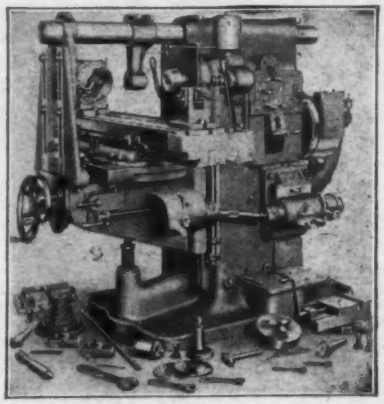
Branch Office 141 Milk St., Boston, Mass. 20



BROWN & SHARPE AUTOMATIC GEAR CUTTING MACHINE

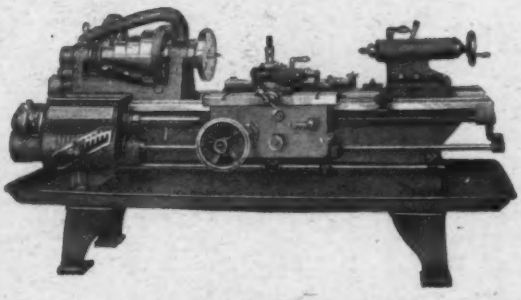


BROWN & SHARPE UNIVERSAL MILLING MACHINE (Constant Speed Drive)

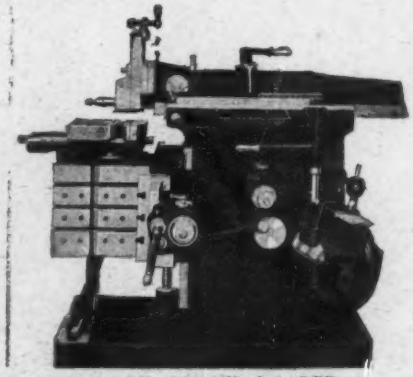
AT THE TEXTILE EXPOSITION

to be held in Greenville, South Carolina, October 18th to 23rd, we will have in actual operation the four machines shown on this page. We have spared no expense in making this the most complete exhibit of its kind ever shown in the South and we invite every Executive, Superintendent and Master Mechanic of the Southern Textile Mills to visit our exhibit during the Exposition. We will be located in booths 51, 52, 53, 62, 63 and 64 on the first floor of Textile Hall. Our exhibit will be in charge of Messrs J. C. Walraven, L. A. Quinn, J. D. McCord, J. M. Fraser and A. E. Mandeville. Mr. Mandeville is being sent down from the BROWN & SHARPE factory to demonstrate their Universal Milling Machine and Automatic Gear Cutting Machine. The HENDEY Lathe and SHAPER will be demonstrated by Mr. L. A. Quinn.

The Exposition this year will be the best ever held, both from an artistic and educational standpoint, and you can't afford to miss it. Make your plans now to be there—Remember the dates—October 18th to 23rd inclusive.



HENDEY ENGINE LATHE



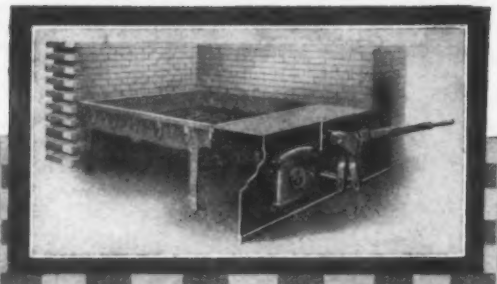
HENDEY CRANK SHAPER

In selling the above machines we state that they are the best to be had. See them at the Exposition and be your own judge.

THE WALRAVEN COMPANY

MACHINERY AND MILL SUPPLIES

36-38 W. Alabama St. **Atlanta, Ga.**



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15% LESS COAL

Means many dollars saved every day of the year – and the AJAX will do better than this in most cases.
Our claims are based on results given in actual service over a long period of years-

Ajax will save coal- - Save labor- - Cut upkeep - and increase steam.

Our Booklet "The Economical Burning of Coal" will be mailed, without obligation, on request.

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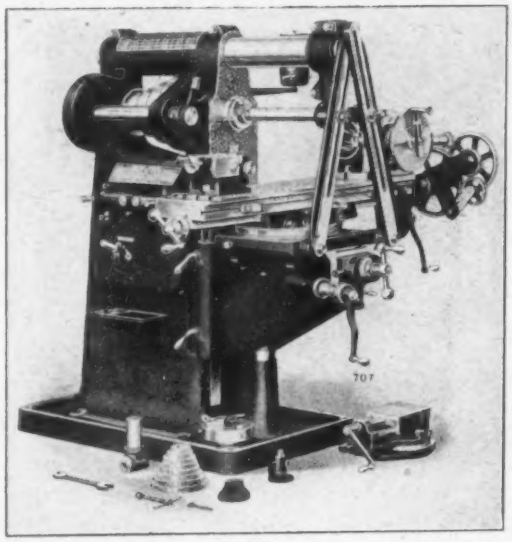
WILLIAMSPORT, PA.
ESTABLISHED 1865

"VALLEIRON"
V

Make Your Own Machine Parts



CINCINNATI
No. 2 Universal Cone-Driven
MILLER

This machine is especially suited for the textile mill tool room and for a general line of manufacturing work.

It is the most up-to-date machine able to handle the most modern milling requirements. It has great power, rigidity, convenience of operation and is adapted to light and heavy manufacturing and tooling.

Its new and exclusive features will be found interesting to every machinist, who will at once recognize the CINCINNATI superiority over any other miller. Write for circular.

We carry a full line of machine tools, in fact

Everything for the Up-to-Date Machine Shop

LATHES DRILL PRESSES SHAPERS PLANERS ELECTRIC MOTORS AUTOMATIC GEAR CUTTERS, ETC.

"Economy is buying wisely, not cheaply." Get in touch with us before you purchase any machine tools or shop supplies.

SEEGER MACHINE TOOL CO.
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Tycos TEMPERATURE INSTRUMENTS

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Recording

Controlling

Link Science with Industry

IN every industrial activity of modern times mankind is dependent on the proper uses of heat.

Tycos Indicating, Recording and Controlling Temperature Instruments have removed the element of guesswork from all heating and cooking problems.

They have been the decisive factor in making possible quantity production.

In solving thousands of special temperature problems we have probably solved your difficulties—a letter will prove it.

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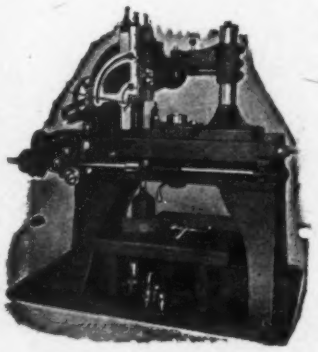
ROCHESTER N.Y.

There's a *Tycos* or *Taylor* Thermometer for Every Purpose

CCP

FULL AUTOMATIC, SEMI-AUTOMATIC and HAND OPERATED

Gear Cutting Machines!



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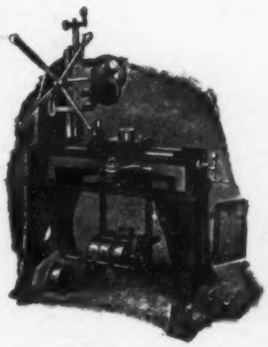
Cotton Mills.

Hundreds Now in Use.

Send for special circulars.



The D. E. Whiton Machine Company

New London, Conn.

The SCOOP Is The Point

In loading trucks from stock piles, etc., the scoop on the Scoop Conveyor adds greatly to its efficiency. The material is scraped onto the feed end instead of shoveled into a feed hopper. You can readily figure this saving — one man can readily scrape a ton of material onto a conveyor in one-fourth of the time it would require him to shovel it.

DUE to the "Scoop" on the feed end of the Scoop Conveyor, it is not necessary to construct a track hopper or pit to unload hopper bottom cars. This makes it possible to unload cars quickly at any point along the track. To unload a car, it is only necessary to push the scoop end under the hopper doors, open the doors, and the material is carried away by the belt as fast as it flows through.

Write for Catalog No. 56

Portable Machinery Co., Inc.
Passaic, N. J.

LANE'S UNIQUE RATCHET TOOLS

"OFF-SET" RATCHET SCREW DRIVER

This tool was designed for working in close quarters, where the work cannot be reached by a straight handled screw driver.

The Ratchet Features enable the operator to use this Tool in a very narrow space and at the same time secure a very great leverage.

The BITS are milled square at tips, thus securing a perfect fit in screw slots, which also prevents lifting out of the slots, as is the case with tapered tips.

The handle is 6 inches in length, drop-forged and case-hardened. Two accurately milled Bits, made from highest grade screw driver steel, are furnished with each Tool.

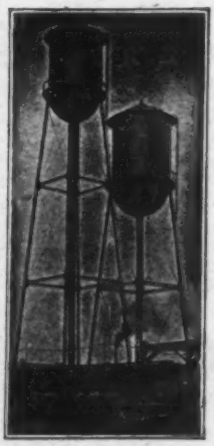
Packed in individual Paper box.
Weight, 5 ounces.

LIST PRICE $2.00

Sold by Jobbers Throughout the World.

Manufactured by
WILL B. LANE UNIQUE TOOL CO.
180 N. Dearborn St., CHICAGO, ILL.

TOWERS and TANKS
That are Built Right



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Tell us what you want and let us quote prices.

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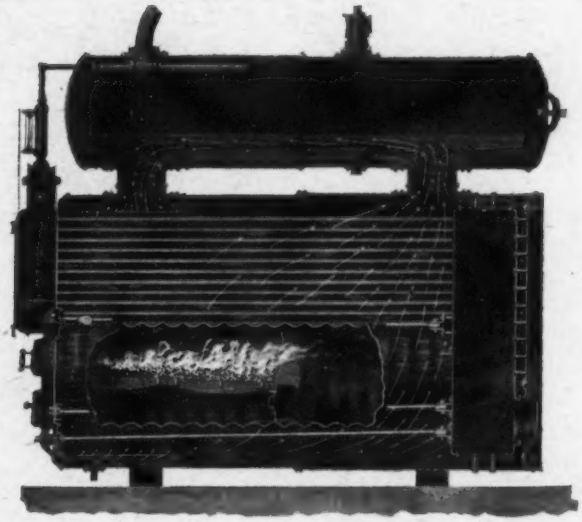
Chattanooga, Tenn.

More Dry Steam With Less Fuel



HERE'S a perfect Scotch Boiler—a boiler that will generate more steam with less fuel.

Rapid, unrestricted circulation is absolutely necessary to the efficiency of any boiler, and while this feature is claimed for by many boiler manufacturers, the design of this boiler is such that it is positive at all times.

Large overload capacity, dry steam generated, and the remarkable flexibility of meeting fluctuating demands particularly adapts this boiler to severe conditions in industrial mills and plants.

Greater economy is assured because of the circulating passage, which delivers water from the front neck to the bottom of the shell.

A constant temperature is assured because of this circulation which relieves uneven strains and stresses on this type of boilers.

There are no troublesome brick settings, as the boiler is self-contained and is ready for operation upon delivery.

Write today for detail information.

INTERNATIONAL ENGINEERING WORKS, Inc.
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Southern Representative,
Isaac Hardeman, Charlotte, N. C.

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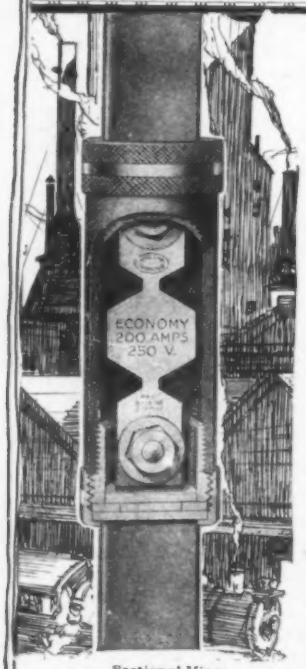
Horizontal and Vertical, Water Tube, Return Tubular, Scotch and Manning Type Boilers, Shaking Grates, Etc.

Sectional View Economy Ferrule Type Fuse and Economy "Drop Out" Renewal Link

ECONOMY *renewable* FUSES



Sectional View
Economy Knife Blade Fuse

Consider the Fuses in Your Plant

Proper protection of lives, property and machinery in all industrial plants using electrical energy depends upon the accurate functioning of fuses used.

Economy Fuses are absolutely accurately rated. They operate unfailingly when overloads, short-circuits and lightning discharges cause hazards to lives, apparatus and property.

Nothing is destroyed but the inexpensive strip of fusible metal — quickly and easily replaced by a new Economy "Drop Out" Renewal Link.

This feature cuts annual fuse maintenance costs 80% as compared to use of one-time fuses.

Avoid production delays; it requires but a minute to restore a "blown" Economy Renewable Fuse to its original efficiency.

Instruct your electrician to install Economy Renewable Fuses at once.

For sale by all leading electrical jobbers and dealers.

Economy Fuse & Mfg. Co., Chicago, U.S.A.

Economy Fuses are also made in Canada at Montreal

Economy Fuses were the first line using an inexpensive bare link for restoring a blown fuse to its original efficiency to be approved in all capacities by the Underwriters' Laboratories.

From New York Eve. Sun.

PLUNGES TO PLATFORM AS TUBE TRAIN IS HELD UP

A fuse blew out on a Hudson and Manhattan train, west bound, as it entered the Exchange place station in Jersey City during the rush hour yesterday. Walter Thompson, thirty years old, of Delawanna, a passenger, was so scared by the report and smoke that he plunged head first through a window upon the platform. He was cut on the face and arm and was taken to the Jersey City Hospital in an ambulance.

The road was blocked twenty minutes while the burned-out fuse was replaced. The Exchange place and Grove street stations were jammed for three-quarters of an hour.

This could not have happened with *Atlas* 4-in-1 Multiple Fuses

When an Atlas blows on short circuit, even on 600 volts, there is no noise, no flame, and no smoke. Why?—because of the patented silencer feature which smothers the arc, cools the temperature of the gases and reduces their pressure: Result a silent blow.

Atlas Fuses are Fool-proof and can be renewed only with self-contained elements, and it is impossible to insert any metallic substance which renders inefficient the fuse as it is received from the factory.

Guaranteed to operate strictly in accordance with specifications for enclosed fuses as promulgated by Underwriters' and Factory Mutual Laboratories.

The approval labels

FM and UND. LAB. INSPECTED.

insure perfect performance

Send for sample, prices, and comparative statement showing costs based on authentic laboratory tests.

Multiple Electric Products Co., Inc.

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Canadian Branch Toronto, Ontario

Quick Action

Modern business demands it. Time is the most valuable asset of the executive.

STROMBERG-CARLSON INTER-COMMUNICATING SYSTEMS

add hours to the business day—eliminate loss of precious minutes—save endless unnecessary footsteps.

They are easily installed—require no switchboard or operator. Their operation is simplicity itself.

Push *ONE* Button *ONCE*—and Talk.

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Each Would Be Useless Without the Other

Unfailing Service

In the struggle and stress of modern business life every moment of delay represents a loss of time and money which cannot be regained.

When promptness, accuracy and dispatch are the vital elements in the delivery of electric equipment or supplies it is natural to turn to the Carter Electric Company for service.

This is an organization whose members are trained to meet the demands of any emergency and this organization is ready to serve you on an instant's notice.

If your requirements cover Rubber Conduit Wire, Switches, Safety Switches, Wiring Devices, Fuses, Lamps or other electric supplies, it is only a matter of a few hours before we can place them in your hands.

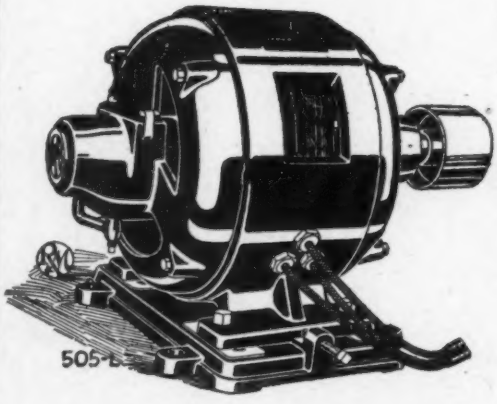
This is because our warehouses are always fully stocked—everything you may need and in large quantities—and with every modern facility for handling your business the Carter Electric Company pledges you **Unfailing Service.**

Carter Electric Company

63 Peachtree Street, Atlanta

BRYAN ELECTRIC CO.

58 EDGEWOOD AVENUE, ATLANTA, GA.



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Estimates Furnished.

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Stencil Work for Cotton Mills Our Specialty

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190 COURTLAND STREET ATLANTA, GA.
Gear Cutting and Machine Work.
No job too large or too small for us.
We specialize in cotton mill and oil mill welding and machine work.
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Advertising conserves the Manufacturer's time by acquainting him with a service or product at his leisure long before the need for such arises.

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FOR
COTTON MILL CONSTRUCTION

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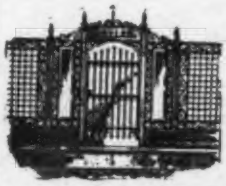

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Selling Direct to Consumer.
NEW ACCOUNTS SOLICITED.

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The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness, and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

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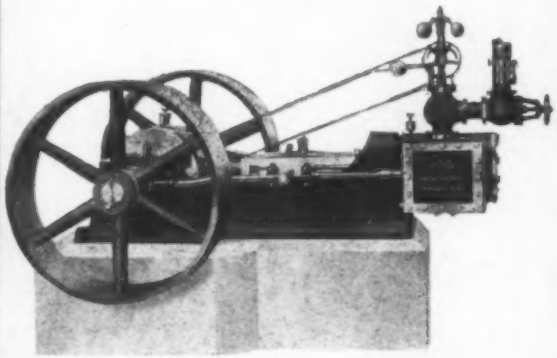
and Havre, France.



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TOCCOA, GA.
LAVONIA, GA.
ATLANTA, GA.

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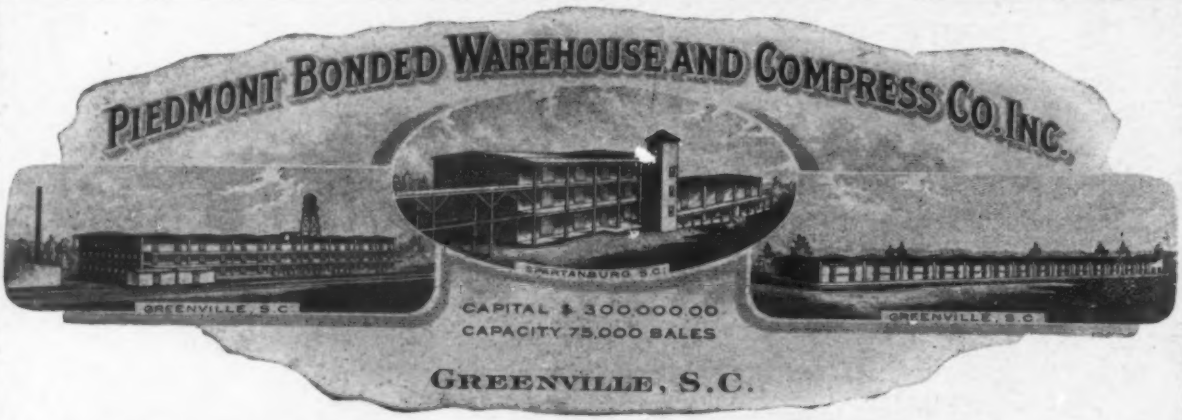

OVER 500,000 bales of cotton are consumed annually within a radius of 50 miles of this Warehouse.

Situated in the midst of the great Cotton Manufacturing district of the Carolinas.
Facilities for distributing Mill Cotton are unsurpassed.
Have re-shipping privileges, without additional cost, from all points throughout the Cotton States, South and West of Atlanta, Georgia.
Its receipts are well and favorably known to all Southern, Eastern and Western Banks.
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CINCINNATI

THE courtesy of the Hotel Sinton's personnel and the fine cuisine of this modern hostelry are points of note among commercial travelers and tourists.

THE HOTEL SINTON offers extensive accommodations. A fine, new 300-room wing is to be completed July 20, 1920.

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Management
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An exceptionally high-grade man, with office established in the North, and with an excellent clientele, desires to connect as Direct Selling Agent, on 2% Commission basis, with high-grade Southern Mills manufacturing the following counts:

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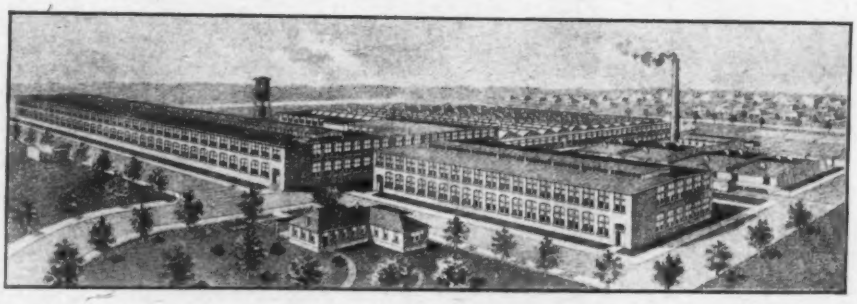

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Wherever there is a clear-headed, far-seeing, courageous management in the South there is going to be continued prosperity. As markets become stabilized, there will possibly be some need for adjustment. If the Atlanta National Bank's experience, gained through more than a half-century's dealings with problems of southern business men, can be of assistance in this connection, it will be given—cheerfully and fully.

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Special inquiries are cordially invited.

The National Shawmut Bank of Boston

Capital, Surplus and Undivided Profits over $22,000.000

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and especially in Georgia

You need The Citizens & Southern

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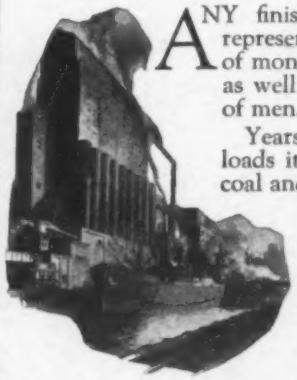
Atlanta—Marietta at Broad

Savannah Macon Augusta

No account too large, none too small"

Money Works!



ANY finished product represents the labor of money and credit as well as the labor of men.

Years before a ship loads its first cargo, coal and ore must be mined, steel fabricated, labor paid. The ship earns nothing until it is chartered. It never could have been built without the labor of men, money and credit.

The vast resources of the National Bank of Commerce in New York are an essential element in commerce and industry.

National Bank of Commerce
in New York
Capital, Surplus and Undivided Profits
Over Fifty-five Million Dollars

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Inaugurated by GUARANTY TRUST COMPANY OF NEW YORK
and LIBERTY NATIONAL BANK OF NEW YORK

Classified Opportunities.

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S. S. STORER, M.E., C.E.
Complete plans for
Textile Mills, Commercial Buildings, Bridges.
Personal Attention, Fees Reasonable.
Atlanta, Ga.

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Two practical Hosiery men of ten years' experience manufacturing children's cotton hosiery desire connections with a Hosiery Manufacturer; to start and operate a new mill in the West, on a commission basis. Write "B & L"—care COTTON.

SALESMEN WANTED:

If you call on Superintendents, Managers, Engineers or Purchasing Agents of Cotton Mills, regularly, and are in a position to entertain an exclusive commission sales agency proposition to be handled as a side-line, it may pay you to get details. One party has been making from $4,000 to $6,000 per year out of the proposition and only operating in two states, selling to the coal mines and steel plants. No samples to carry. References exchanged. 978 Arcade, St. Louis.

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Salesmen calling on the textile mills, and interested in new lines of machinery, paints, building supplies or chemicals, either as a side line or exclusively will find it profitable to write, giving experience, territory covered and other details. Correspondence strictly confidential. Cotton, 1021 Grant Building, Atlanta, Ga.

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FRANK TOOMEY, Inc.,
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FOR SALE.

3—40" Kitson Single Beater Breaker Lappers with feeder.
3—40" Single Beater Intermediate lappers
3—40" Single Carding Beater finisher lappers.
1—24" Dodge Jute Picker with bit feed.
1—32" Smith & Furbush Wool Picker.
1—Smith & Furbush Willowing machine.
1—60 x 42 James Smith Cone Waste Willowing machine.
1—Kitson Thread Extractor with condenser.
4—40" Platt Cards.
4—40" Herthington Cards.
25—Head Whitin Drawing 12" coil, metallic roll.
20—Head Whitin Drawing 12" coil leather roll.
1—12 x 6 Providence Slubber 64 spindles.
1—12 x 6 H & B Slubber 56 spindles.
2—10 x 5 H & B Intermediate speeders 108 spindles.
2—4 x 6 Lowell Spoolers 136 spindles each.
1—Banks Spooler 256 spindles.
1—Payne Spooler 56 Spindles.
1—56 spindle Collins Skein Winder for cotton or worsted for 4 x 6 two head bobbin.
4—6 spindle Universal Winders No. 50 cone and tube attachment.
3—6 spindle Universal Winders with cone attachment No. 50.
1—24 spindle Allen Winder.
3—16 spindle Lowell Cameless Winders.
1—9 spindle North Chelmsford Ball Winder, practically new.
1—12 spindle Pranelin Ball Winder 8" gauge.
2—16 spindle Silver & Gay Ball Winders.
1—Lowell Single Cylinder Slasher.
1—6' x 4 H & B Slasher.
160—40" "A" Model Draper Looms 24 bobbin magazine.
1—Lowell Single Cylinder Slasher.
140—36" "A" Model Draper Looms 24 bobbin magazine.
20—Lindsey Hyde Reels.
6000—3 x 5 wood head Spools.
5000—4 x 6 Wood head Spools.
9000—3 ½ x 6 wood head Spools.
20,000—3 ½ x 5 Metal Bound Spools.

We also represent the Griffin Cotton Tire Straighteners.

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8 176 Needle (88x88) 3¾" 36 gauge Wildman Ribbers
15 128 Needle (64x64) 3¾" 24 gauge Wildman Ribbers
Two-feed, with stop motions and roll take-ups. Designed for knitting plain tubing for canvas gloves. Excellent machines—$115 each, crated f.o.b. cars.
25 132 needle 3¾" 24 gauge Invincible Knitters
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Complete for making Men's Half Hose-yarn changers and reinforcing attachments, one transfer ring and double drive pulley each machine.
Price $20 each for the lot boxed f.o.b. cars.
1 24" Jones two cylinder Napper, in first-class order. $50 f.o.b. cars.

J. Broadbent & Son, Inc.
Unionville, Conn.

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Crescent Belt Fastener Co.
Belt Lacing.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co
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Bobbins.
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U. S. Bobbin & Shuttle Co.
Whitin Machine Works.
Bobbin Heads.
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International Engineering Wks., Inc.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.
Boiler Feed Water Purification.
American Water Softener Co.
Borromite Co. of America.
Hulme, J. S.
Permutit Co.
Refinite Co.
Scaife & Sons, Wm. B.
Boiler Room Fittings & Supplies.
Crane Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.
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Lockwood, Greene & Co.
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Anchor Post Iron Works.
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Birmingham Slag Co.
Blair Lumber Co.
Corrugated Bar Co.
Detroit Steel Products Co.
Dixie Portland Cement Co.
Dowman, George.
Dufur & Co
High-Grade Mfg. Co.
Hydraulic Steelcraft Co.
Kirkpatrick Lumber & Timber Co.
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Calender Rolls.
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Butterworth & Sons Co., H. W.
Roy & Son, B. S
Perkins & Son, Inc., B. F.
Calendering Machine for Rolls.
Simplex Roll Calendering Machine Co.
Calling System (Inter Telephone).
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Proctor & Schwartz, Inc.
Sargents Sons & Co., C. G.
Textile Finishing Machinery Co., The
Carding Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.
Card Clothing.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.
Card Feeds.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
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Card Grinding Machinery.
Roy & Son Co., B. S.
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If you want to produce better yarn at less cost, it will pay you to see what we have to offer at the

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Campbell Manufacturing Company

Randolph Crompton
President

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Slater Building
Worcester, Mass.

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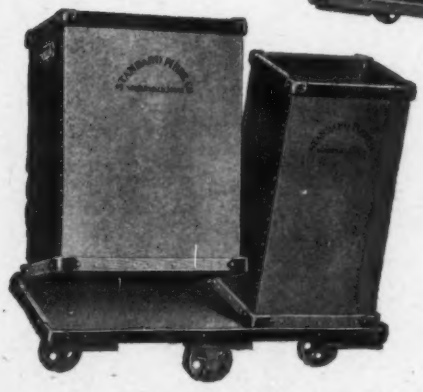
Gen. Mgr.

Factory
Barre Plains
Massachusetts

"The BEST Receptacles Made?"

"YES—and The Best That Can Be Made."



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Quotations, etc., upon application.

STANDARD FIBRE CO.

MILLER STREET SOMERVILLE, MASSACHUSETTS

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Cement Reinforcement.
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Cooledge & Sons, F. J.
Dixon Crucible Co., Jos.
Peaslee-Gaulbert Co., Inc.
Patterson-Sargent Co.
Tropical Paint Co.
Wadsworth Howland & Co., Inc.

Centrifugals.
Cresson-Morris Co.

Chain Drives.
(See Belting—Chain Link.)

Chain (Block, Bicycle, Auto Engine, Agricultural, Etc.)
Morse Chain Co.

Chairs and Stools
Pick & Sons, Albert.
Reisehmann Co
Sani Products Co.
Wright Co.

Chemicals.
(See Dyestuffs and Chemicals.)

Chlorine Gas.
Electro Bleaching Gas Co

Cleaning Machine (Suction)
United Electric Co.

Clocks (Hank, Etc.)
(See Counters.)

Clocks (Time).
Eco Clock Co.

Clocks (Watchman).
Eco Clock Co.
Chicago Watchman Clock Wks.
Dixie Electric Equip. Co.

Closets (Water).
(See Toilets.)

Cloth Cutters.
Cameron Machine Co.
Firsching, J. A.
Wildman Mfg. Co.

Cloth Room Machinery.
Butterworth H W & Sons Co.
Cameron Machine Co.
Firsching, J. A.
Foster Machine Co.
Saco-Lowell Shops.
Scott & Co., Henry L.
Textile Finishing Machinery Co.
Wildman Mfg. Co.

Cloth Shrinking Machinery.
Reliance Machine Works.

Cloth Testers.
Scott & Co., Henry L.

Cloth Tubes.
Southern Novelty Co.

Cloth Winders.
(See Winders)

Clutches (Friction.)
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.

Clutch Linings.
Diamond State Fibre Co.

Coal Driers (Centrifugal).
Link-Belt Company.

Coal Handling Machinery.
Link-Belt Company.
Portable Machinery Co.

Coal Tar Disinfectants.
(See Disinfectants.)

Cocks.
(See Valves).

Color Pails.
(See Buckets—Mills.)

Color Testers.
Atlas Electric Devices Co.

Comb Aprons.
(See Aprons.)

Commission Merchants and Dealers.
(See Cotton Cloth Commission Merchants.)

Compresses.
Piedmont Bonded Warehouse & Compress Co., Inc.

Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Walraven Co., The

Concrete Reinforcement.
Birmingham Slag Co.
Corrugated Bar Co.

Condensers.
Allis-Chalmers Mfg. Co.
Seeger Machine Tool Co.

Conduits.
Diamond State Fibre Co.

Condulets.
Crouse-Hinds Co.

Cones (Cloth).
Southern Novelty Co.

Cone Winders
Foster Machine Co.

Connectors (Frankel Solderless)..
Westinghouse Elec. & Mfg. Co.

Consulting Engineers.
(See Architects & Engineer.)

Contractors and Engineers (Building).
Aberthaw Construction Co.
American City Eng'g Co.
Dowman, George.
Dallis, Park A.
Ferguson Co., Jno. W.
Hydraulic Steelcraft Co.
Goode, R. L.
Gude, & Co
Robbins & Son, J. E.
Spiker & Lose.
Thompson & Binger.

Contractors (Electrical).
(See Electrical Engineers.)

Contractors (Painting).
Marshall Co., H. Newton.

Controlling Instruments (Temperature).
General Electric Co.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Conveyors (Belt).
(See Belt Conveyors.)

Conveying Machinery.
American Supply Co.
Collins, J. D.
Cresson-Morris Co.
General Utilities Co.
Hulme, J. S.
Link-Belt Co.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Portable Machinery Co.
Richards-Wilcox Mfg. Co.
Rowell Co., J. Kirk.
Seeger Machine Tool Co.
Schofield, Wm. Co.
Walraven Co.
Valley Iron Works.

Conveyors (Portable).
Portable Machinery Co.

Coolers.
(See Humidifying Apparatus.)

Coolers (Water).
(See Water Coolers.)

Cooling Towers.
(See Tanks and Towers.)

Copper Stamps and Stencils.
(See Stamps, Stencils, Etc.)

Cordage Machinery.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co. The.

Corrugated Bars.
Corrugated Bar Co.

Cotton Yarn and Cloth Commission Merchants and Dealers.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Iselin & Co., Wm.
Southern Cotton Yarn Co.
Weimar Bros.
Woodward Baldwin & Co.

Cotton Dealers and Brokers.
Beer, H. & B.
Cooper & Griffin, Inc.
Cutts, E. A.
International Cotton Prod. Co.
Richardson-McAlister Co.
Webb, Inc., C. S.

Cotton Mill Machinery and Supplies.
Allen Spindle Corp.
Atlantic Textile Co.
Atlanta Harness & Reed Mfg. Co.
Barber-Colman Co.
Butterworth & Sons, H. W.
Carolina Supply Co.
Cocker Mch. & Foundry Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Firsching, J. A.
Fletcher Works.
Greist Mfg. Co.
Greenville Spool & Mfg. Co.
Hopedale Mfg. Co.
Howard & Bullough.
Jones Mchry. Corp.
Mason Machine Works.
Phila. Drying Mchy. Co.
Proctor & Schwartz, Inc.
Sargent's Sons, Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Slaughter Mchry. Co., C. G.
Shawmut Eng'g Co.
Smith & Furbush Mach. Co.
Southern Textile Mchry. Co.
Stafford Co
Steel Heddle Mfg. Co.
Terrell Machine Co.
Textile Finishing Machinery Co.
Universal Winding Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.
Wilson Co.

Cotton Tape Loom.
Fletcher Works.
Schaum & Uhlinger.

Cotton Yarn Mills.
(See Yarn Manufacturers.)

Counters (Revolution, Hank, Pick, Etc).
Veeder Mfg. Co.
Precision Machine Co.

Counters (Restaurant).
(See Restaurant Equipment).

Couplings (Shaft).
Chicago Pulley & Shafting Co.
Cresson-Morris Co.

Covers (Roller).
Diamond State Fibre Co.

Cranes.
(See Hoists.)

Crayons.
Dixon Crucible Co., Jos.
Lovingood Co.
Lowell Crayon Co.
Regnas & Co., J. R.

Creosote Oil and Creosoting.
Gulf States Creosoting Co.

Crushing Machinery.
Allis-Chalmers Mfg. Co.

Cutters (Cloth).
(See Cloth Cuters.)

Cypress Lumber.
Southern Cypress Mfg. Asso.

Cutters (Thread).
(See Thread Cutters.)

Dairy Supplies.
Dairy & Farm Supply Co.
Hackney Bros. Co.

Deep Wells and Supplies.
Hughes Specialty Well Drilling Co.

Dehumidifying.
Sturtevant Co., B. F.

Delivery Cases.
(See Boxes—Packing.)

Dial Scales.
(See Scales).

Dies (Steel).
(See Stamps, Stencils, Etc.)

Directory (Textile Mill).
Davison Publishing Co.

Discs (Fibre).
Diamond State Fibre Co.

Dishes and Glassware.
Chattanooga Queensware Co.
Pick & Son, Albert.
Sani Products Co.
Wright Mfg. Co.

Disinfectants.
Barrett Co., The
Sanitas Co.

Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

Doffing Boxes (Mill).
(See Boxes—Mill.)

Doffing Cars.
(See Cars.)

Door Closers and Checks.
Richards-Wilcox Mfg. Co.

Door Hangers.
Dowman, George.
Richards-Wilcox Mfg. Co.

Door Mats (Steel).
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.

Draft Gauges.
See Gauges, Draft.

Doubling Machines.
Foster Machine Co.

Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Drills (Electric).
(See Electric Machinery.)

Drinking Fountains.
(See Fountains—Drinking.)

Drop Wires.
Greist Mfg. Co.
Steel Heddle Mfg. Co.

Drying Apparatus.
New York Blower Co.
Sturtevant Co., B. F.

Drying Forms (Hosiery).
Pearson, Jos. T.

Drying Machinery.
American Laundry Mchry. Co.
Butterworth, H. W. & Sons Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The

Dust Collectors.
(See Blowers and Blowing Systems.)

Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
American Processing Co.
King, Habersham.

Dyeing, Bleaching, Finishing and Printing Machinery.
American Laundry Mchry. Co.
Atlas Electric Devices Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Hulme, J. S.
Permutit Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Refinite Co.
Reliance Machine Works.
Rome Mch. & Fdry. Co.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The
Tolhurst Machine Works.

Dye Sticks.
Phila. Drying Machinery Co.

Dyestuffs and Chemicals.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Hemingway Inc., Frank
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co
National Oil Products Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Sonneborn Sons, Inc., L.
Sutlass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques
Zavon Co., Inc.

Electric Cleaning System (Suction)
United Electric Co.

Electors.
Sherwood Mfg. Co.

Electric Dynamos and Motors.
(See Motors and Generators.)

Electric Fans.
(See Fans—Electric.)

Electric Lamps.
(See Lamps.)

Electric Lamp Guards.
Flexible Steel Lacing Co.

Electrical Engineers and Contractors.
Dixie Electrical Equipment Co.
Huntington & Guerry, Inc.

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Atlas Electric Devices Co.
Benjamin Electric Co.
Bryan Electric Co
Carolina Supply Co.

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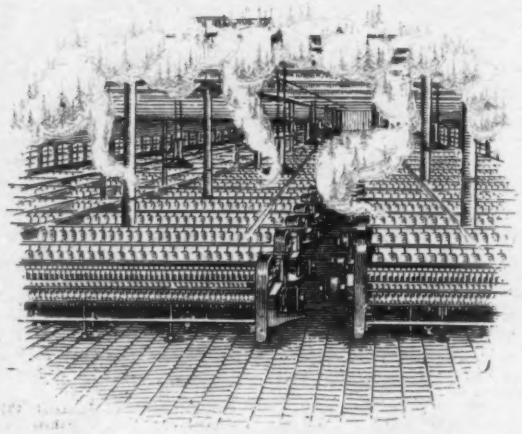

There is direct relationship between the physical condition of your employees and your profits which can be measured in dollars and cents. Listless workers—absence here and there means but one thing—lower production. With lower production goes depleted profits.

Depleted profits from such causes are no longer excusable. Authorities tell us that much of the sickness and loss of vitality among factory workers is due to the constant breathing of impure air—a condition which can be remedied.

If you could transplant the pine forests right into your mill—if you could surround your workers with the healthful invigorating atmosphere that for centuries has made the pine forests famous—picture the result. And that is just what you can do through the use of SANITAS Humitas in your humidifying system at a cost of only a few cents a day.

SANITAS Humitas is not an ordinary pine oil or pine tar disinfectant. It contains in concentrated form chemical principles generated naturally in the pine forests and to which their hygienic influence is due. Employed regularly in your humidifying system it will impart an antiseptic fragrance to the air that will tend to increase the efficiency of your employees and add to their health and comfort.

SANITAS Humitas mixes readily with water and is especially prepared so that its continued use will not gum up humidifying heads.

We will be glad to tell you more about SANITAS Humitas.

TRY THIS TEST
Let us send a small sample of SANITAS Humitas without obligation to you. Pour a little in a tumbler of warm water and inhale deeply the vapors that arise. Note the stimulating effect. Then try out your present preparation in the same way and compare the difference.

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BUYERS' INDEX—Continued.

Carter Electric Co.
Crouse-Hinds Co.
Cutter Co., George.
Dixie Electrical Equipment Co.
Economy Fuse & Mfg. Co.
General Electric Co.
Hulme, J. S.
Jones Mchry. Corp.
Multiple Electric Products Co.
Seeger Machine Tool Co.
Slaughter Mchry. Co., G. G.
Southern Textile Mchry. Co.
United Electric Co.
Walraven Co., The
Walsh & Weidner Boiler Co.
Westinghouse Electric & Mfg. Co.
Wilson Co.

Electrical Repairing (all kinds).
Bryan Electric Co.
Dixie Electrical Equipment Co.

Electric Tractors and Trucks.
(See Tractors & Trucks—Elec.)

Elevators (Portable).
Collins, J. D.
Lovingood Co.
Rowell Co., J. Kirk.

Elevators.
Link-Belt Company.
Seeger Machine Tool Co.

Enamel—Mill White.
(See Paint).

Engineers (Mill).
(See Architects.)

Engines—Oil, Gas and Gasoline.
Seeger Machine Tool Co.

Engines—Steam.
Allis-Chalmers Mfg. Co.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Sons Co., J. S.
Toomey, Frank
Walsh & Weidner Boiler Co.

Engine Room Appliances and Supplies.
Carolina Supply Co.
Crane Co.
Cutter Co., George.
Graton & Knight Mfg. Co.
Jenkins Bros.
Lunkenheimer Co.
Slaughter Mchry. Co., G. G.
Southern Textile Mchry. Co.
Sherwood Mfg. Co.
Walraven Co.
Wilson Co.

Exporters (Cotton).
(See Brokers.)

Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems.)

Fasteners (Belt).
(See Belt Fasteners.)

Feed Water Purifiers.
(See Boiler Feed Water Purification).

Felting Machinery.
Smith & Furbush Mch. Co.

Fence—Steel and Iron.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dowman, George.

Fibre Products.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Rowell Co., J. Kirk.
Standard Fibre Co.

Filters—Water.
American Water Softener Co.
Boromite Co. of America.
Hulme, J. S.
Permutit Co.
Refinite Co.
Scaife & Sons Co., Wm. B.

Filters (Oil Removal).
Permutit Co.
Sherwood Mfg. Co.

Filters (Sand).
Permutit Co.

Finishing.
(See Dyers, Bleachers and Finishers.)

Finishing, Bleaching and Sizing Materials.
Althouse Chemical Co.
Atlantic Dyestuff Co.
Aniline Dyes & Chemical, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Schrymser Co.
Bosson & Lane.
Corn Products Refining Co.
Dobbins Soap Mfg. Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Keever Starch Co.
Klipstein & Co., A.
National Oil Products Co.
Newport Chemical Works.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
Roessler & Hasslacher Co.
Co.
Sonneborn Sons, Inc., L.
United Chemical Products **Corp.**
Warren Soap Mfg. Co.
Wolf & Co., Jacques
Zavon Co., Inc.

Fire Alarm Apparatus.
Dixie Electric Equip. Co.

Fire Doors and Hardware.
Dowman, George.
Richards-Wilcox **Mfg. Co.**

Fire Hose.
(See Hose—Fire.)

Fire Protecting Paint.
(See Paint).

First Aid Room Equipment.
(See Hospital Equipment.)

Flexible Couplings.
Cresson-Morris Co.

Flood Lights (Elec.)
Crouse-Hinds Co.
General Electric Co.

Flooring (Hardwood).
Blair Lumber Co.
Kirkpatrick Lum. & Timber Co.
Nashville Hardwood Flooring Co.
Southern Cypress Mfg. Co.

Floor Scrubbing Machine.
American Scrubbing Machine Co.

Fluted Rolls.
Campbell Mfg. Co.
Howard & Bullough.
Perkins & Son, B. F.
Saco-Lowell Shops.
Schofield's Sons Co., J. S.
Smith & Furbush Machine Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Founders.
Cresson-Morris Co.
Lombard Fdry. &Mch. Works.

Fountains (Drinking).
Central Brass Mfg. Co.
Crane Co.
Rundle-Spence Mfg. Co.
Southern States Supply Co.

Friction Clutches.
(See Clutches—Friction.)

Fuses.
(See Elec. Mchy. and Supplies.)

Garage Doors and Door Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.

Garnett Machines.
Roy Son Co., B. S.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas.)

Gaskets.
Diamond State Fibre Co.
Graton & Knight Mfg. Co.

Gauge Cocks.
Lunkenheimer Co.

Gauges—Draft.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Gauges—Mercury Column Vacuum.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Gauges—Oil.
Lunkenheimer Co.

Gauges (Pressure).
Tagliabue Mfg. Co., C. J.

Gauges (Recording).
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co

Gauges—Water.
Lunkenheimer Co.

Gears—Silent.
Diamond State Fibre Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

Gear Cutting and Cutters.
Cresson-Morris Co.
Southern Welding & Machine Co.
Whitin Mch. Co., D. S.

Gear Pullers.
General Electric Co.
Grab Co., Inc.

Generators—Electric.
(See Motors and Generators.)

Glassware and Dishes.
(See Dishes).

Governors (Pressure).
Tagliabue Mfg. Co., C. J.

Governors (Pump).
General Electric Co.
Tagliabue Mfg. Co., C. J.

Graphite—Products.
Dixon Crucible Co., Jos.

Grates (Boiler).
International **Eng. Works.**
Lombard Fdy. & Mch. Co.
McNaughton **Mfg. Co.**

Grates (Mechanical).
See Stokers).

Grease.
(See Lubricants.)

Grease Cups.
(See Lubricators.)

Green Houses.
Hulme, J. S.

Grindstones.
Richards-Wilcox **Mfg. Co.**

Grinders—Card, Cylinder Roll, Napper and Garnett.
(See Card Grinding Machinery.)

Guards (Elec. Lamp.)
Flexible Steel Lacing Co.

Guides (Thread).
Mitchell-Bissell Co.
Palmer Co., I. E.

Gums.
(See Finishing and Sizing Materials.)

Guy Anchors.
Crouse-Hinds Co.

Hangers.
(See Shafting and Hangers.)

Harness—Loom.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.

Heads (Bobbin & Spool).
Diamond State Fibre Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus.)

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Steel Heddle Mfg. Co.

Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.

Hinges & Butts.
McKinney Mfg. Co.

Hoists.
General Utilities Co.
Hulme, J. S.
Link-Belt Company.
Morse Chain Co.
Rowell Co., J. Kirk.
Seeger Machine Tool Co.
Walraven Co.

Hose—Fire.
Collins, J. D.
Goodyear Tire & Rubber Co.
U. S. Rubber Co.

Hosiery Dyeing Machinery.
Cocker Mch. & Fdry. Co.
Rome Mach. & Fdry. Co.

Hosiery Finishing Boards.
(See Boards.)

Hosiery Forms.
(See Drying Forms.)

Hosiery Yarns.
(See Yarn Manufacturers.)

Hospital Equipment.
Thomas Co., F. H.
Sani Products Co.
Wright Co.

Hotels.
Sinton.

Houses (Ready-Made).
Blair Lumber Co.
Dowman, George.
Hydraulic Steelcraft Co.
Tuxbury Lumber Co.

Humidifying Apparatus.
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Humidity Indicating Instruments.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Inst. Co.

Hydraulic Turbines.
(See Turbines—Steam.)

Hydro Extractors.
(See Extractors.)

Hydrometers.
Taylor Instrument Co.

Hygrometers.
Taylor Instrument Co.

Hygrodeiks.
Taylor Instrument Co.

Indicating and Recording Instruments and Thermometers.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Indigo.
(See Dyestuffs and Chemicals.)

Industrial Relationship Service.
Sherman Service, Inc.

Injectors.
Lunkenheimer Co.
Sherwood Mfg. Co.

Insulation (Vulcanized Fibre).
Diamond State Fibre Co. Bal

Insurance.
Miller Indemnity Underwriters.

Ink—Stencil and Marking.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.
Rowell Co., J. Kirk.

Iron Work—Ornamental.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dowman, George.
Dufur & Co.
Lombard Iron Works & Supply Co.

Jacks.
Paulus, Chas. B.

Jacquards.
Crompton & Knowles Loom Wks.

Jute Bagging Machines.
Smith & Furbush Mach. Co.

Kettles—Size.
(See Size Kettles.)

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleaching Kiers.)

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers.)

Knit Goods Washers.
(See Washers—Cloth.)

Knitting Machinery and Supplies.
Adams Co., Geo. H.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Scott & Williams.
Wildman Mfg. Co.

Laboratory Instruments & Thermometers.
Tagliabue Mfg. Co., C. J.

Lacing (Belt).
(See Belt Lacing.)

Lamps—Incandescent and Arc.
Benjamin Electric Co.
Boston Economy Lamp Div.
Bryan Electric Co.
Carter Electric Co.
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.
Jones Mchry. Corp.
Walraven Co.
Westinghouse Lamp Co.

Lamp Guards (Key Locking).
Flexible Steel Lacing Co.

Lamp Reflectors.
Benjamin Electric Co.
Bryan Electric Co.
Carter Elec. Co.
Crouse-Hinds Co.
Cutter Co., George.
Ivanhoe-Regent Works.

Landscape Architects.
(See Village Architects.)

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Latch Needles.
Paulus, Chas. B.

Laundry Machinery.

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Tolhurst Machine Wks.

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Jos. A. Vogel Co.

Leather Belting.
(See Belting.)

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Greenville Belting Co.
Jewell Belting Co.
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Williams & Sons, I. B.

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Crouse-Hinds Co.

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Link Belting.
(See Belting—Linen.)

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Link-Belt Company.
Portable Machinery Co.

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Atlantic Textile Co.
Carolina Supply Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
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Mason Machine Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
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Draper Corporation.
Hopedale Mfg. Co.

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N. Y. & N. J. Lubricant Co.
Swan & Finch Co.
Texas Co.

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N. Y. & N. J. Lubricant Co.
Sherwood Mfg. Co.

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Kanmagraph Co.

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Regnas & Co., J. R.
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Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

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Dowman, George.
Hydraulic Steelcraft Co.
Lupton's Sons Co., David

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Hydraulic Steelcraft Co.
Lombard Iron Works & Supply Co.

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Bryan Electric Co.
Carter Electric Co.
General Electric Co.
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Westinghouse Elec. & Mfg. Co.

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Taylor Instrument Co.

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Mill Villages.
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Mill Supplies (Misc.).
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Mill White Paint.
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Richards-Wilcox Mfg. Co.

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Bryan Electric Co.
Carter Electric Co.
Dixie Electrical Equipment Co.
General Electric Co.
Hulme, J. S.
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Seeger Machine Tool Co.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.

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Regnas Co., J. R.

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Roy & Son Co., B. S.

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Paulus, Chas. B.

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Hampden Paint & Chem. Co.
Johnson & Co., Inc., Oliver.
Patterson-Sargent Co.
Southern Cotton Oil Co.
Wadsworth, Howland & Co., Inc.

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Wayne Oil Tank & Pump Co.

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Tagliabue Mfg. Co., C. J.

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Whitin Machine Works.

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Schofield Auto Music Co.

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Phila. Drying Machinery Co.

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Bunn & Co., B. H.

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Hightower Box & Tank Co.
Walke Box Co., Inc.
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Graton & Knight Mfg. Co.
Jenkins Bros.
Walraven Co.
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Cooledge & Sons, F. J.
Du Pont de Nemours & Co., E. I.
Gulf States Creosoting Co.
Hampden Paint & Chem. Co.
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Patterson Sargent Co.
Peaslee-Gaulbert Co., Inc.
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Tropical Paint Co.
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Marshall Co., H. Newton.

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Bradley Mfg. Co., A. J.
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Roessler & Hasslacher Chemical Co.

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Scofield Auto Music Co.
Stieff, Chas. M.

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Schofield, Wm. Co.
Smith & Furbush Mach. Co.

Pickers—Leather.
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Picker Sticks.
Garland Mfg. Co

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Saco-Lowell Shops.
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Whitin Machine Works.

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Diamond State Fibre Co.
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Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
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Seeger Machine Tool Co.
Walraven Co., The

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Hill-Standard Co.
Medart Mfg Co., Fred.

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Allis-Chalmers Mfg. Co.
Carlyle-Johnson Mch. Co.
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Graton & Knight Mfg. Co.
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Jewell Belting Co.
Jones Mchry. Corp.
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Link-Belt Company.
Morse Chain Co.
Russell Mfg. Co.
S K F Industries.
Seeger Machine Tool Co.
Slaughter Mchry. Co., G. G.
Southern Textile Mchry. Co.
Standard Pressed Steel Co.
Stanley Belting Corp.
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U. S. Rubber Co.
Valley Iron Works.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.
Wilson Co.

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Economy Baler Co.
Galland-Henning Mfg. Co.
Lovingood Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Seeger Machine Tool Co.
Smith & Furbush Mch. Co.
Textile Finishing Machinery Co., The

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Chicago Pulley & Shafting Co.
Cresson-Morris Co.
Diamond State Fibre Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Seeger Machine Tool Co.
Valley Iron Works.
Walraven Co., The

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Goodyear Tire & Rubber Co.
Stanley Belting Corp.
Williams & Sons, I. B.

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Hughes Specialty Well Drilling Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Textile Finishing Machinery Co.
Toomey, Frank
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Taylor Instrument Co.

Pyrometers.
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Taylor Instrument Co.

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Terrell Mch. Co.
Dufur & Co.

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General Electric Co.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

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Tagliabue Mfg. Co., C. J.

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Tagliabue Mfg. Co., C. J.

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Taylor Instrument Co.

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Atlanta Harness & Reed Mfg. Co
Emmons Loom Harness Co.

Reed Cleaning & Polishing Machines.
Atlanta Harness & Reed Mfg. Co
Shawmut Eng'g Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Kowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield, Wm. Co.
Whitin Machine Works.

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General Electric Co.
Tagliabue Mfg. Co., C. J.

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Southern States Supply Co.

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General Electric Co.
Tagliabue Mfg. Co., C. J.
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Tagliabue Mfg. Co., C. J.

Reinforcing Slag.
Birmingham Slag Co.

Reinforcement Bars for Concrete.
Corrugated Bar Co.

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Jones Mchry. Corp.

Repairing (Textile Mchry, etc).
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Atlantic Textile Co.
Chattanooga Brazing & Welding Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

Restaurant Equipment.
Chattanooga Queensware Co.
Reischmann Co.
Pick & Co., Albert
Sani Products Co.
Wright Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spining Ring Co.
Whitin Machine Works.

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Rivets (Belt).
Crescent Belt Fastener Co.

Rocker Shaft Bearings.
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Rolls (Calender.)
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Campbell Mfg. Co.
Perkins & Son, B. F.
Roy & Son Co., B. S.

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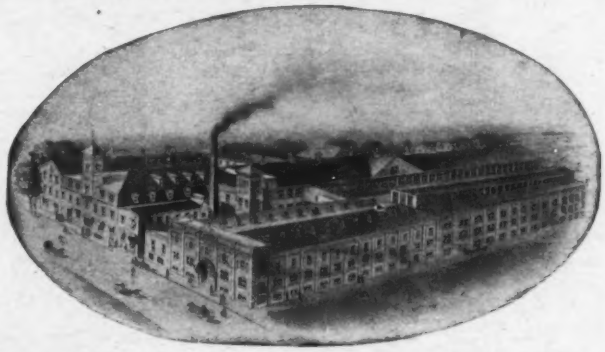

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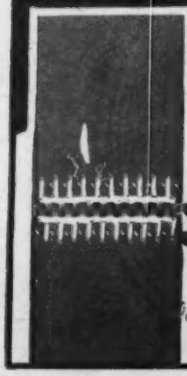

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Dail Steel Products Co.
Hackney Bros. Co.
Kaustine Co.
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Sanitas Co.

Sani Products Co.
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Lupton's Sons Co., David

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Rogers Fibre Co.
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Standard Fibre Co.
Seeger Machine Tool Co.
Signode System, Inc.
Torsion Balance Co.
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Judson Mills.

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Phila. Drying Machine Co.
Textile Finishing Machinery Co., The

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Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

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Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The

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Jordan Mfg. Co.

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Hydraulic Steelcraft Co.
Lupton's Sons, Co., David

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Birmingham Slag Co.

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Lovingood Co.
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Saco-Lowell Shops.
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Piper Roofing Co., J. A.

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Barrett Co.

Sliding Partition Hardware.
Richards-Wilcox Mfg. Co.

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Cameron Machine Co.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

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Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
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Borne, Scrymser Co.
Dobbins Soap Mfg. Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Hemingway & Co., Frank
Klipstein & Co., A.
Newport Chemical Works.
Pick & Co., Albert
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques

Soda Ash.
Klipstein & Co., A.

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Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Borne, Schrymser Co.
Bosson & Lane.
Dow Chemical Co.
Durex Chemical Co.
Du Pont de Nemours & Co., E. I.
Grasselli Chemical Co.
Hemingway & Co., Frank
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Klipstein & Co., A.
Moore Oil Refining Co.
Newport Chemical Works.
National Oil Products Co.
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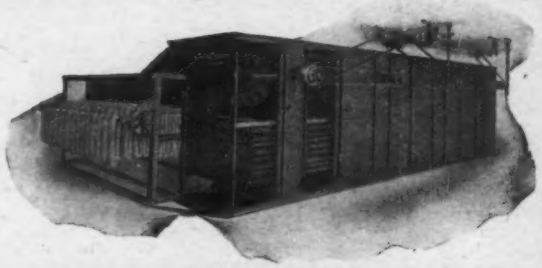

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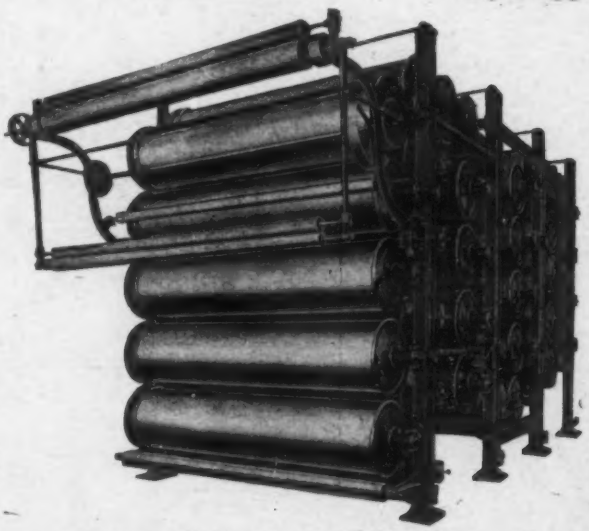

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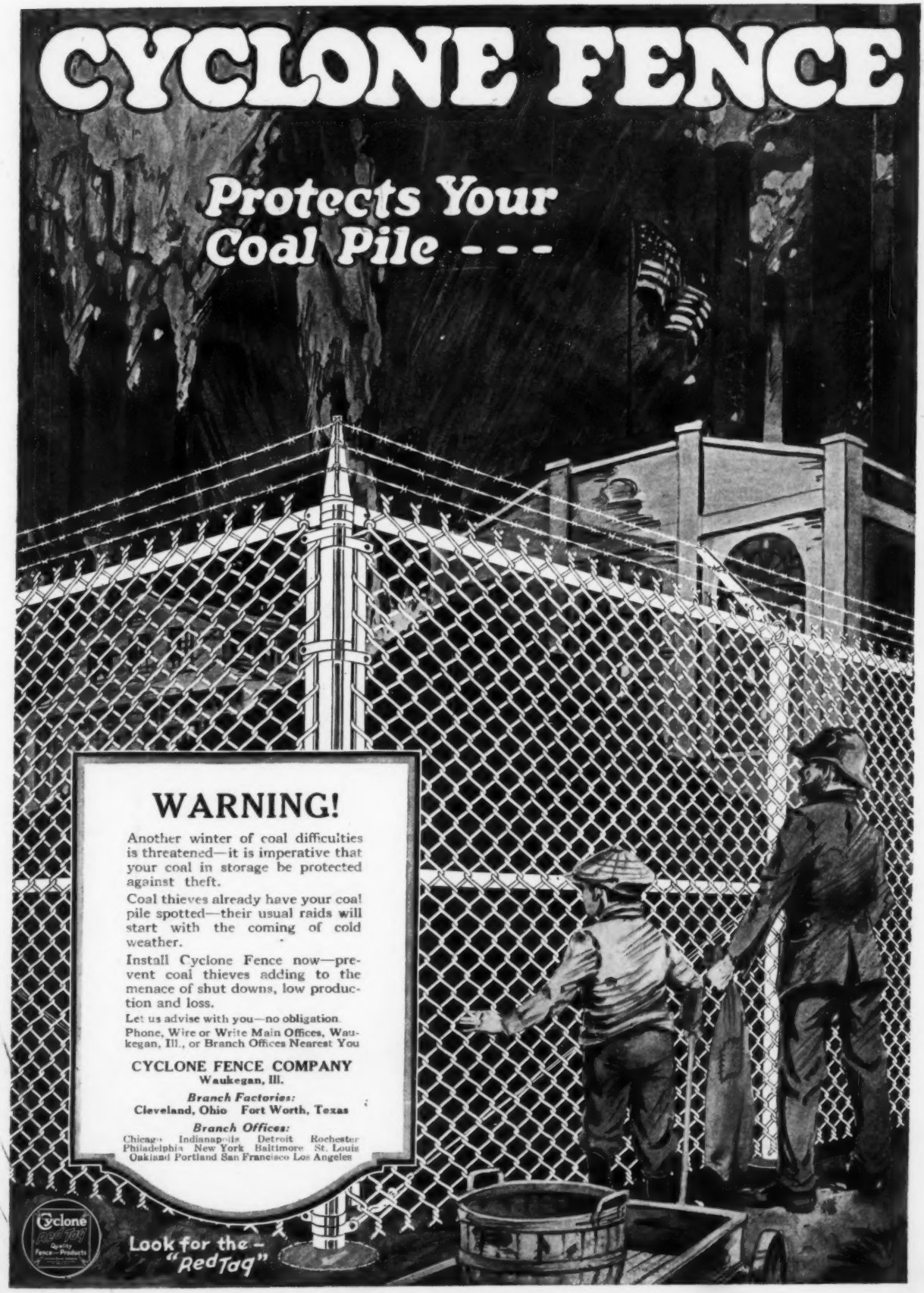
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